M. S. University Archaeology Series No. 4

STONE AGE INDUSTRIES OF THE BOMBAY & SATARA DISTRICTS

By

S. C. Malik

B.Sc. (Hons.), M.Sc. (Delhi).
Post-Grad. Dip. in Arch. (London).

Lecturer in Archaeology,
FACULTY OF ARTS,
M. S. UNIVERSITY OF BARODA

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Maharaja Sayajirao University of Baroda
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Dedicated
to the memory of my teacher
Professor V. Gordon Childe

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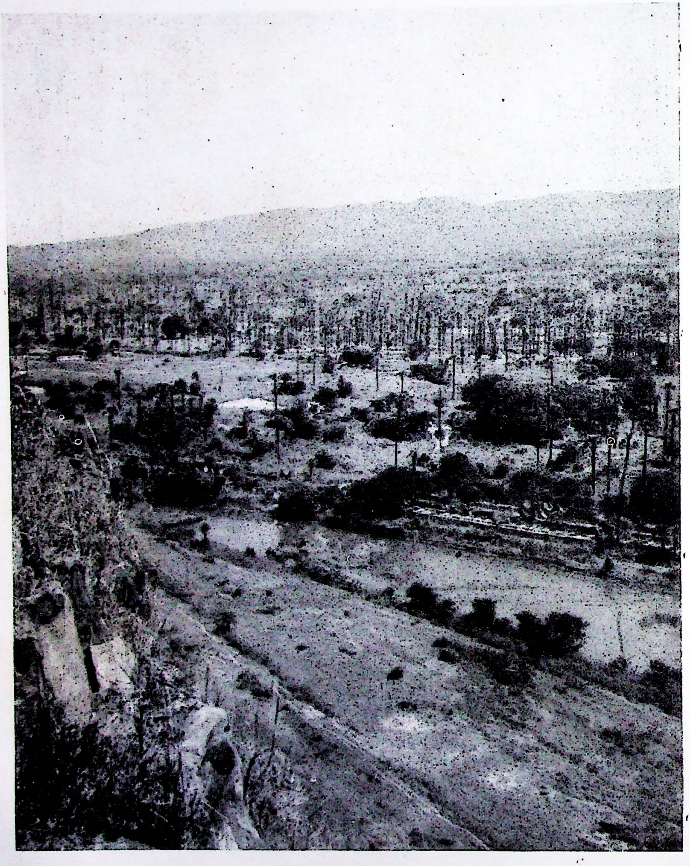
Frontispiece.



Khandivli.

STONE AGE INDUSTRIES OF THE BOMBAY AND SATARA DISTRICTS

Introduction :

The study of natural environment is important for Prehistorians because it is necessary to reconstruct the adaptation of a human group to its environment. It is by now an evident fact that there is a close relation between physical regions and cultural areas. Specially so, when during the Stone Ages man was governed by the biological environment or " Biome " : he depended on the food he hunted or gathered. Chase was his speciality, supplemented by fishing and digging up roots, etc. Any change in this environment—the habit or habitat of the food he hunted and gathered—caused the movement of these human groups. The migration of animals caused the migration of Early Man, in small groups, and probably gave rise to the early forms of cultural-contact. In fact, the governing of the " Biome " was present for the most part of Man's History until, the sedentary life of food-production in the Neolithic Revolution set in. This stage of Savagery ended with Barbarism when, self-sufficient food-producing communities developed. The environment still played its part but, was more of a partner and an aid to man rather than the former governor. Man continued to hunt and fish but he was no longer dependent on his environment, and began its exploitation to a considerable extent for his benefit.

Man realized that by taming and domesticating the very game he hunted, he had a reserve stock at hand which he could kill at leisure. His spirit, of the age-old tradition of chase continued but, the cereals he domesticated made him a semi-nomad and, he continued to return to the land where he ' cultivated ' his food. Life became secure. It was only when irrigation systems started (Amratians of Egypt ?) that co-operation of communities and tribes began—it was needed—and led to a more or less sedentary life culminating in urbanization and thence to civilization. The exploitation of the environment was carried out too far and created deserts of the fertile lands, just as the process continues today.

In these Early and Late periods, in the History of Man, the study of the environment is important both for the Prehistoric and the Historic archaeologist. The most modern methods and techniques tend to prove that without the aid of the allied branches of Natural Sciences, the reconstruction of any ancient society—its complete and overall picture—is not possible. Unsolved chronological problems present a haphazard picture but the study of the environment helps to solve this, also.

Thus, environment, which played such an important part in the life of Stone Age Man, as a field of study is not to be neglected. Raw material which governed the requirements of his tools and implements, stresses the importance of geological studies. Of course, water was (and is still) the most important factor governing the settlement pattern of groups and societies. Therefore, river valleys, lakes and areas near them, are the most likely spots for locating the archaeological—Prehistoric—sites. Rivers indicate the climatic fluctuations that took place since their fluctuations, depositions, depend upon the volume of water they carry, which in turn, indicates the environment, whether it was cold, hot or dry, etc. Thus, we are able to reconstruct, to some extent, his environment. The game he hunted is also indicated by the climate which characterizes different plants and animals and thus, is another way of learning about the flora and fauna that flourished in those times. This is secondary, of course, to palaeontological studies.

All this, briefly, stresses the importance of a field much neglected in India—a field which is very important for throwing light on Stone Age Man. In fact, Prehistoric Archaeology almost entirely depends, for chronological purposes and for establishing the environmental conditions, on the Natural Sciences.

Extensive explorations were carried out during the period between September 1956 to June 1957, in the area of the Bombay, Thana and Satara districts. The area covered for Bombay was about 40 miles north of Bombay city and included some portions of Thana district north-east of the city. The Satara district includes the areas of Mahableshwar, Panchgani, Satara and Wai. The last two sites are

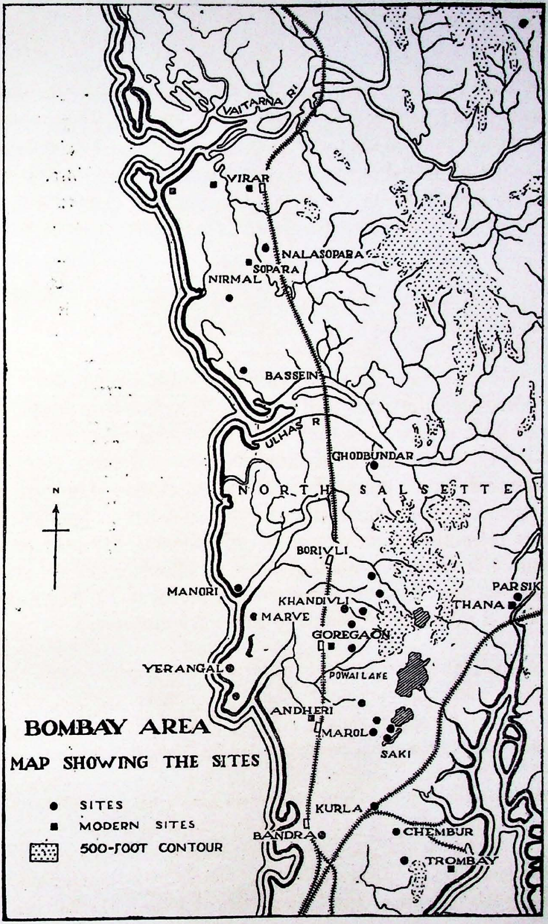


Fig. I. Map showing the sites.

situated on the banks of the Krishna river. The first season's—September to December 1956—work in the Bombay area was aimed at locating the 'blade and burin' horizon of Todd,[1] particularly in relation to the recent discoveries of the 'smaller' lithic industries in the areas of Gujarat and Maharashtra. This 'blade and burin' horizon is missing in North Gujarat which is an area extensively explored by Zeuner,[2] Sankalia[3] Subbarao,[4] and others. The support to explain this gap, has been taken from the climatic sequence as revealed by the river sections since rivers are sensitive instruments for recording climatic fluctuations. The climatic sequence—as also the sequence of the lithic industries—is revealed along the valleys of rivers such as the Sabarmati, Mahi, Narmada, Pravara, Godavari, Krishna ; and along their tributaries. A rough outline of the stone industries, therefore, emerges from these explorations in the hilly and ghat areas and the river valleys of the regions. The 'Early' or the Lower Palaeolithic industries were conspicuously absent from the collection. A tentative sequence was, however, established because the earlier industries were located in stratified geological river deposits overlain by the later industries. There is further, evidence of the late survival of the Microlithic industries into the historical period—much later than hitherto supposed. This spread in time of the Microlithic industries is confirmed by the findings in other areas of India. Thus, this monograph mainly deals with the 'Middle Stone Ages'[5] or Series II[6] or the 'flake-blade-scraper'[7] industry and the Microlithic industries.

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1. TODD, K. R. U., 1939—"Palaeolithic industries of Bombay". *J. R. A. I. LXIX.*

2. ZEUNER, F. E., 1950—*Stone Age and Pleistocene Chronology in Gujarat.* Poona.

3. SANKALIA, H. D., 1946—*Investigation into the Pre-historic Archaeology of Gujarat.* Baroda.

4. SUBBARAO, B., 1952—"Archaeological Explorations in the Mahi valley", *Journal of the M. S. University of Baroda,* Vol. I, No. 1.

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6. SANKALIA, H. D., 1956—"Animal-fossils and Palaeolithic Industries from Pravara Basin at Nevasa, District Ahmednagar." *Ancient India No.* 12.

7. MALIK, S. C., 1957—"Bombay Palaeolithic Industries—a re-evaluation", *Journal of The M. S. University of Baroda.* Vol. VI, No. 1.

GEOLOGY, GEOGRAPHY AND CLIMATE

Geology and Geography :

Bombay and Satara districts are a component of the geographic region of Western India,[1] which is the land between the Northern natural region of Sind and the Malabar coast in the South—with the Eastern boundaries coinciding roughly with the administrative boundaries of the bilingual Bombay State. Western India has a varied topography and consists of coastal belts, alluvial plains and plateau forms. Culturally it has the well marked zones of Kathiawar, Gujarat, Maharashtra and Karnatak. Thus, the geology, geography and climate of the Bombay and Satara districts (which form part of Maharashtra) is to be understood in relation to the larger unit of Western India.

India is divided geographically into the Indo-Gangetic basin, the Himalayan arc and the Deccan Peninsula. The geological history of Western India is subsidiary to that of the Deccan Peninsula which is one of the most ancient and stable parts of the earth and once formed a continuous plateau with the Aravalis at the Northern end. Archean rocks, characterized by metamorphosed gneisses and schists with intrusions of granite, form the basal complex of the Deccan Peninsula. The Dharwar system of rocks, which occur as bands of schistose rocks in the gneisses and granites, deposited in the Archean system were subsequently denuded considerably by the Epiarchean Interval consisting of several cycles of erosion, mountain building and peneplanation. This Interval was succeeded by the deposition, in parallel sedimentary strata, of the rocks of the Cuddapah and the Vindhyan system. The Deccan Peninsula landmass remained undisturbed from the Cambrian to the Middle Carboniferous (Dravidian Era) except for physiographical changes of an erosional nature. Commencing with the Upper Carboniferous, the Peninsula developed a series of basin-shaped depressions due to powerful earth movements, crustal tensions. Rocks of the Gondwana system were

1. DESHPANDE, C. D., 1948—*Western India—A Regional Geography*. Dharwar.

deposited in these depressions. Subsequently, Gondwanaland broke up and layers of lava poured over the Peninsula at about the same time the Himalayas were uplifted from the Northern Sea. The breaking up of the Gondwanaland resulted in the present shape of the Deccan Peninsula giving the Western portion the characteristic "Trap"[1] topography of modern times. No rock-building stage has occurred since then, in the Peninsula, except along the coastal region where the relative rise and fall of the sea level and denudation has created residual hills and basins and, also the recent deposits in the shallow depressions. Sub-aerial influences have created Laterite formations on the Deccan-trap and in other regions the "Regur" soil.

The Archean system outcrops in the Southern zone of Western India, in the border lands that separate Gujarat from Malwa and, in Cutch. The Dharwar system is represented by the type area and extends from the Southern slope of the trap to the Kaveri basin. The Cuddapah system is represented by the metamorphosed sedimentary rocks of the Kaladgi series comprising quartzites, limestones, shales and breccia, mainly. The only representative of the Vindhyan system are the Bhima series of the Karnatak region in Western India, which develop typical limestone and quartzite topography. Weathering has given a characteristic landscape to the Deccan trap which occupies the largest area in Western India, extending from the Southern flanks of the Narmada valley to the banks of the Krishna, outcrops in Central and Southern Kathiawar and, as a band in Central Cutch. In the Tapi valley it is covered by the recent alluvium and reaches a maximum thickness of 10,000 ft. near Bombay. Prismatic jointing has produced step-like series of escarpment on the hill-sides and the "Ghat" aspects of the Western flanks of the Sahyadries.[2] Trap rocks possess a uniform petrological composition in the form of amygdaloidal basalts but with intrusions of acid and ultrabasic rocks in Kathiawar and Gujarat.

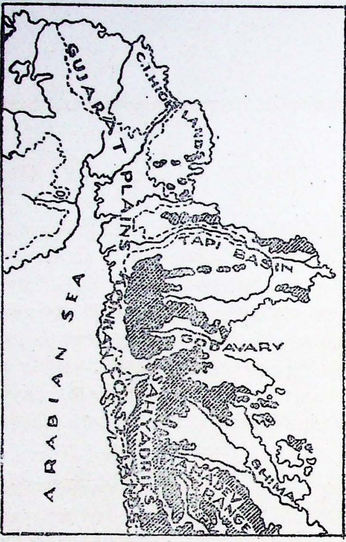
The relief regions[3] of Western India have been classified on the basis of

1. WADIA, D. N., 1953—*Geology of India.*
2. Ibid.
3. DESHPANDE, C. D., 1948—op. cit.

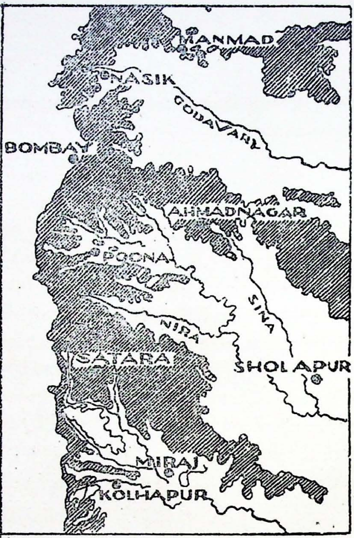
the geological structure and the representative land forms. Crustal movements and the disturbances of the Archean and the Tertiary Periods have influenced the creation of the relief forms of the Plateau and the Coastal Plains. Denudation and deposition have determined the local details in the landscape. For our purpose, the relevant relief regions are, " the Sahyadries and their transverse members, River-basins of the Trap region of the Plateau, the Konkan coastlands and the Gujarat alluvial plains. " (Fig. II).

The alluvial plain of Gujarat, north of Konkan, is a creation of recent origin, of fluviatile and marine depositions. It is drained by four major rivers and is bordered on the north—north-east by the Central Indian Highlands. The basal complex is formed by harder crystalline deposits but the topography is determined by the alluvium which is interrupted by detached hills of volcanic nature, like Pawagarh, or intersected by streams. The erosive action of the major rivers is prominent in the north—north-east and contrasts with detrital deposition of the coastal regions. At the mouth of the rivers, near the coastline is a sandy belt.

The crestline of the Sahyadries is marked by a series of plateau tops like Mahableshwar with a varying altitude between 2,500 and 4,500 ft. above sea level and longitudinally the range runs for 600 miles. East of the Konkan Coastal Plain, trap topography predominates the Maharashtra plateau (which includes the Satara district) and is drained by the Godavari, Bhima and in the south-eastern area, by the Krishna. The Sahyadries form the back-bone of the plateau along the eastern edge. The general slope of the plateau is towards the east and south-east and its trap strata are almost horizontal. The Godavari basin has a limited stretch in this region and widens out further east while the Bhima basin forms a distinct relief region because of its length and drainage, although it is a tributary of the Krishna river. The Krishna basin has a southward trend from its source near Wai to Miraj and the river swerves to the east at the end of the trap region. The Godavari, Bhima and their tributaries exhibit lateral erosion because of the gradual fall in height towards the east, whereas the Krishna shows vertical erosion because of its steep gradient in the region. The lateral erosion of the



RELIEF AND DRAINAGE OF WESTERN INDIA.



THE MAHARASHTRA PLATEAU.

MAHABLESHWAR PLATEAU.

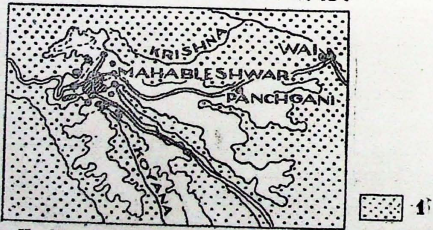


Fig. II. Map showing the sites (1. Land below 4,000 ft.).

After Deshpande

rivers in their course, on almost horizontal stratum, develops meanders and banks of deposition.

The topography and vegetation of the Trap region is effected by the differential erosion due to the varying mineral composition. The dissected highland chains, traversing the region from the west to the east, are characterized by immature and poorer types of soils—carrying mainly grass. The low-lying basins develop mature and fertile black regur soils because of Trap weathering. Ghat terraces and valleys have forests falling into the mixed ever-green woods of teaks and other representative types. Wherever basalt outcrops in a massive form there is practically no vegetation cover. The plateau of Mahableshwar, Panchgani and Matheran form the hill stations. Panchgani is a suburb of Mahableshwar, 12 miles east of it, but because of its easterly orientation, has only 60" of rain whereas Mahableshwar has over 260" per year.

Bombay district forms part of the most varied relief regions of Western India, *i.e.* the Konkan Coastal Plain backed by the Sahyadries. The geological matrix is that of the Deccan Trap. The sites of Bassein, Sopara and Nala Sopara, etc., lie in the southern region of the North Konkan relief region.

South of the Ulhas river lies the Bombay Metropolitan region comprising seven islands with Salsette Island forming the main core. It is a region situated favourably along the coastal route to Gujarat and within easy reach of the Maharashtra Plateau. The islands owe a common origin with the Deccan Peninsula and some geologists[1] recognise four successive periods in its formation, *i.e.*, the Tertiary Era of volcanic activity, deposition of fresh-water strata, secondary effusions and finally the recent period of Esturine-clay and Marine-sand deposition filling up the shallow arms of the sea. The present longitudinal ridges of the Eastern and Western margins of the Island were probably produced by the secondary effusions which gave the Earlier horizontal flows a westward tilt. Later upheavals and

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1. Kalapesi—" Geological History of the Bombay Island ". *Journal of the Gujarat Research Society*. Vol. VIII.

subsidence of the land caused the development of the intermediate belt of plain in the Island which is " underlain by the Blue clay, Littoral concrete and the Upper Alluvium. "

Climate :

The general climatic conditions in Western India are governed by the meteorological forces that prevail over the Continent of Asia with its subcentre as India. Western India exemplifies the monsoonal character of the sub-continent of India. Its regional climatic character is effected by its position in relation to the Arabian Sea, the peninsular landmass and the varied relief of its interior. Following briefly, therefore, is a general summary of the distribution of pressure, temperature and rainfall—factors which give a basis for the classification of climatic subtypes[1]—of Western India, with specific reference to the relevant regions.

The cold weather season of the Peninsula, including a major portion of Western India, is under the influence of North and North-East winds. The regional temperature distribution is influenced by the cold conditions of Northern India modified by the Arabian Sea. The temperature decreases from the coast towards the interior. This season is generally dry with clear skies and sunny weather excellent for archaeological explorations.

The hot season begins from March which sees a transition in climate. There is a rapid rise of temperature in April. All over Western India there is a rise in temperature but it is greater in the interior part of Bombay Deccan. On the Konkan coast the temperatures are lower. The warmer land surface begins to draw in the sea-borne winds and there is an Easterly movement of the wind from this high pressure region over the Arabia Sea to the low pressure zone of the Peninsula. The stage is thus set for the South-West Monsoons.

In the month of June the monsoons ' burst '. The season is marked by overcast skies, increase of humidity and a steady wind but with a succession of

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1. DESHPANDE, C. D., 1948—op. cit.

cyclonic storms followed by fine 'breaks' of fine weather. There is a decline in the rainy season from North Kanara towards Gujarat, for instance, Karwar records an average of 120" rainfall, Bombay 70", Surat 40" and Veraval 18". Mahableshwar with 260" of average rainfall per year, illustrates the wet conditions of the Ghats and Belgaum with 50" indicates the transition between the wet Sahyadries and the dry plateau. By the end of September the South-West monsoons lose their vigour and strength and make way for the North-East monsoons.

The transition to the North-East monsoon is gradual and spread over a long time with a slight general rise of temperature in October. The weakening of the South-West monsoon results in a calm condition but local heating produces thunderstorms. These climatic conditions change by the middle of December when they are succeeded by the temperature and pressure conditions of the cold season.

Raw Material :

To a great extent there is close relation, as with water supply, between the supply of raw material—its distribution—and the sites of Stone Age industries and cultures. The hardness and the way a rock fractures matters a great deal. Different raw material influences the final appearance of the tool and at times has even compelled man to use special techniques. Indian and African industries use inferior varieties of the same material exploited by their European counter-parts. Thus, it would be worthwhile, to briefly, define[1] some of the commonly used rocks and minerals. Following is a list of the chief types :—

Agate :— A mixture of colloidal and crypoto-crystalline silica deposited in amygdaloidal cavities in volcanic rocks such as "Traps". It is harder than trap and is a homogenous material. It is a variegated form of chalcedony, composed of different coloured bands.

Basalt :— Is a fine-grained igneous rock composed essentially of plagioclase-feldspars and Augite. The colour varies from dark grey to black

1. HIMUS, G. W., 1954—*A Dictionary of Geology*. Penguin Reference books.

and, when weathered, it becomes softer and has a greenish or rusty-brown tinge. "The term basalt is generally restricted to lava-flows; similar rocks occurring in minor intrusions are called dolerites." In India it is used for celts like Andesite which is trap-rock—grey volcanic material.

Blood-stone :— A green variety of chalcedony speckled with red.

Carnelian :— A translucent variety of chalcedony red or brownish in colour.

Chalcedony :— May be regarded as a mixture of crystalline and amorphous silica, *i.e.*, of quartz and opal : cryptocrystalline variety of silica. It occurs, as nodules, in limestone and also in volcanic rocks as veins.

Chert :— A fairly pure siliceous rock which is a grey variety of cryptocrystalline silica. It is found in limestone as nodules. The colour varies from light grey to black when fresh but weathers to various shades of yellow and brown. "Weathered pebbles are often pierced by tiny holes or pores" and are known as Pinholed Chert. The fracture is generally more splintery or flat than flint or quartz. Sometimes any inferior variety of cryptocrystalline silica is referred to as chert or "cherty" material.

Diorite :— A coarse-grained igneous rock. It is plutonic like granite but the composition is like Andesite.

Dolerite :— A term much used for somewhat coarsely crystalline rocks of Andesitic and basaltic composition .

Granite :— An igneous rock, coarsely crystalline and used for stone cairns, giant boulders, for architecture in South India and sometimes for the Megaliths.

Gneiss :— A coarsely crystalline rock of granitic or dioritic composition. "Gneisses may be the result of metamorphic action on igneous

rocks, giving orthogneisses, or on sediments, when the products are called paragneisses. "

Jasper :— Is opaque impure cryptocrystalline silica, usually red, brown, yellow or green and some varieties are beautifully banded with different shades. It may be formed in cavities like chert or agate or from sedimentary cherts by heat alternation in contact with igneous rocks.

Obsidian :— " A volcanic glass, of granitic composition, generally black in colour, having a glassy or satiny lustre and a conchoidal fracture. "

Opal :— There are numerous varieties of this form of amorphous silica, containing varying amounts of water. Its occurrence is like agate but it is of a glassy lustre and in different colours. Highly prized as gemstones.

Quartzite :— " A granulose metamorphic rock, representing a crystallized sandstone ". The sandstone grains are cemented together by silica or the grains of which are formed by metamorphism. It is associated with sedimentary rocks and is found in the company of schists and gneisses. It forms hard and resistant pebbles of reddish-brown and various other colours.

Rock-Crystal :— Is pure crystallized silica free from water and associated with amygdaloid cavities in trap rocks. But it is also formed in opened fissures of crystalline rocks and even in sediments.

Sandstone :— " A compacted detrital sediment consisting pre-dominantly of grains of quartz between 2 and 0.1 m.m. ". There are numerous minerological varieties depending on the nature of the cementing material.

Schists :— These are " foliated metamorphic rocks which can be split into thin flakes or flat tenticles ", because of the prevalence of lamellar minerals such as mica, chlorite, talc, etc.

Trap :— A name for the vast sheets of lava poured out over the Indian Peninsula in the Cretaceous and early Tertiary periods. It is of varying composition—trachytes, andesites and basalts being encountered. It is mostly fine-grained but sheet lava is porous and, therefore, useless as raw material. But rocks of the dykes are excellent material and thus, Neolithic sites are located in South India near trap dyke outcrops. Trap rocks have a conchoidal fracture.

Vein-Quartz :— Commonly occurs in the form of dykes in igneous areas and frequently in the basement complex of India. Its small crystals are not of much use as raw material but have been used in certain Microlithic industries.

Plate II

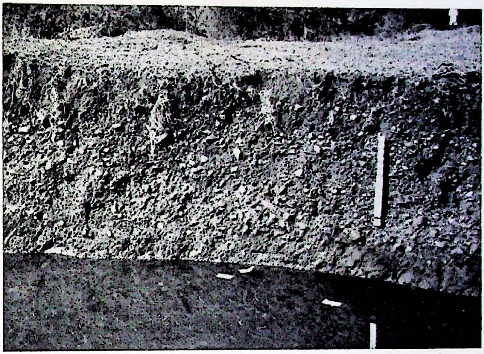
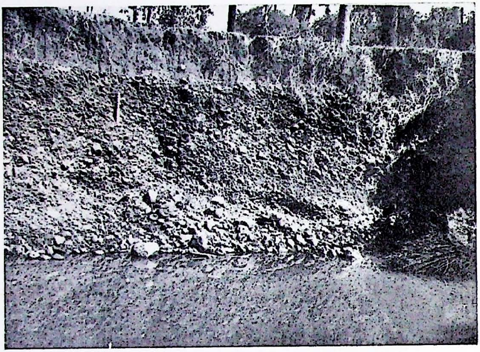


Plate II Khandivli section showing Upper clay, Upper gravel and Middle clay



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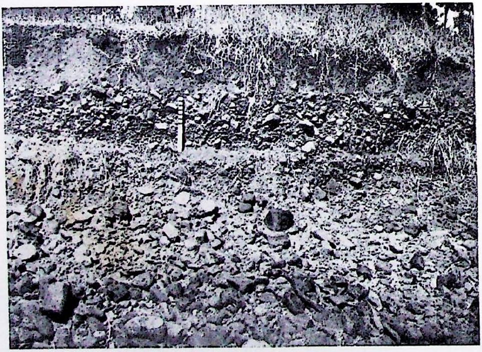

B

Plate III A. Borivli section on right bank of Dahisar.
B. Another Borivli section.

STRATIGRAPHY IN THE BOMBAY AREA

Palaeolithic industries of Bombay (Fig. IV) were published in 1939 by Todd[1] and he mentions the main section at Khandivli with a similar sequence appearing at Borivli and at Goregaon. His industrial sequence begins with the Chelles-Acheul complex and Clactonian followed by the ' flake-blade-scraper ' and the ' blade and burin ' industry and, a Microlithic industry on the surface. This was the first case of a continuous sequence of stone-age industries found in a stratified position in India. Moreover, it was unique to find an ' Upper Palaeolithic ' industry " insitu ". Before this, Burkitt and Cammiades, ' Series III[2] filled in the gap in the Indian Stone Age sequence, but not being in a stratified position other prehistorians did not give it a serious thought. Sometimes the tools of the " smaller " industry were found elsewhere but were classified as ' not conforming to any known type ' or, as Deterra and Paterson[3] classified this industry from the Hoshangabad-Narsingpur area as ' Proto-neolithic '. The latter material was not even illustrated.

Curiously enough, very few have had access to Todd's material and although he was frequently referred to in papers, neither was there further work done to confirm his ' blade and burin ' industry elsewhere in India, nor was there a serious attempt to verify his sequence in Bombay, specially since some people had a doubt whether his small 6-7 feet section could reveal such a continuous lithic sequence and also because at that stage of Indian Prehistory the appearance of the ' Upper Palaeolithic ' seemed improbable.

Briefly, Todd's[4] sections at Khandivli in the South and the East comprise

1. Todd, K. R. U., 1939—op. cit.

2. Burkitt, M. C. & Cammiade, L. A., 1930—" Fresh light on the Stone Age Cultures of South India. " *Antiquity IV.*

3. Deterra, H. & Paterson, T., 1939—*Studies on the Ice Age in India and Associated Human Cultures.* Carnegie Institute, Washington. 493.

4. Todd, K. R. U., 1939—op. cit.

two aggradational deposits resting on a bluish-brown clay which in turn rests on rock bottom. The laterised upper portion of the Lower Gravel in the Southern section equates with the Middle Clay of the Eastern section. On top of this horizon in both the sections a ' flake-blade-scraper ' industry begins and continues into a finer variety at the end of the first phase of the second aggradation (which is the Upper Gravel east and the Rubble south) and the beginning of the last phase, which is the Upper Clay. (Fig. V).

At present, Khandivli (Fig. III) has no high sections because of extensive quarrying in the past, and erosion. Microliths are available on the surface and on the hill behind the National Physical Education Institute about a mile east of the station. At isolated places where the sections are intact the Upper Gravel yields few examples of genuine, although not very specialized, tools of this ' flake-blade-scraper ' industry. The length of this small river from its source to the mouth is only a few miles. Therefore, the deposits need not be expected to be of an enormous nature. At most places a Middle Clay yellowish in colour is followed by the Upper Gravel and Upper Clay. The Lower and Upper aggradations are not exposed simultaneously as at Borivli.

The doubt about these sections was removed when exploring the neighbourhood area of Borivli where the river Dahisar flows. The explorations were carried out within a two mile stretch of the river in the National Park enclosing the Kanheri caves and on the hills, west of the river. The sections are about 12-14 feet in height at several places. On the rock bottom lies the bluish-brown clay looking like rock. This is topped by two aggradational deposits, that is, a Lower cemented gravel greyish in colour followed by nine inches to a foot of fine gravel and 1-2 feet of reddish brown silt. This silt and the fine gravel equate with Todd's Middle Clay which is not found here but it does not alter the situation of two aggradational deposits. The silt is followed by the Upper aggradation of a yellowish loose gravel and a silty clay on which lies the modern land surface. (Fig. III).

Goregaon, a little to the south of Khandivli, has only two instances of sections showing both the aggradational deposits because most of the area is in-

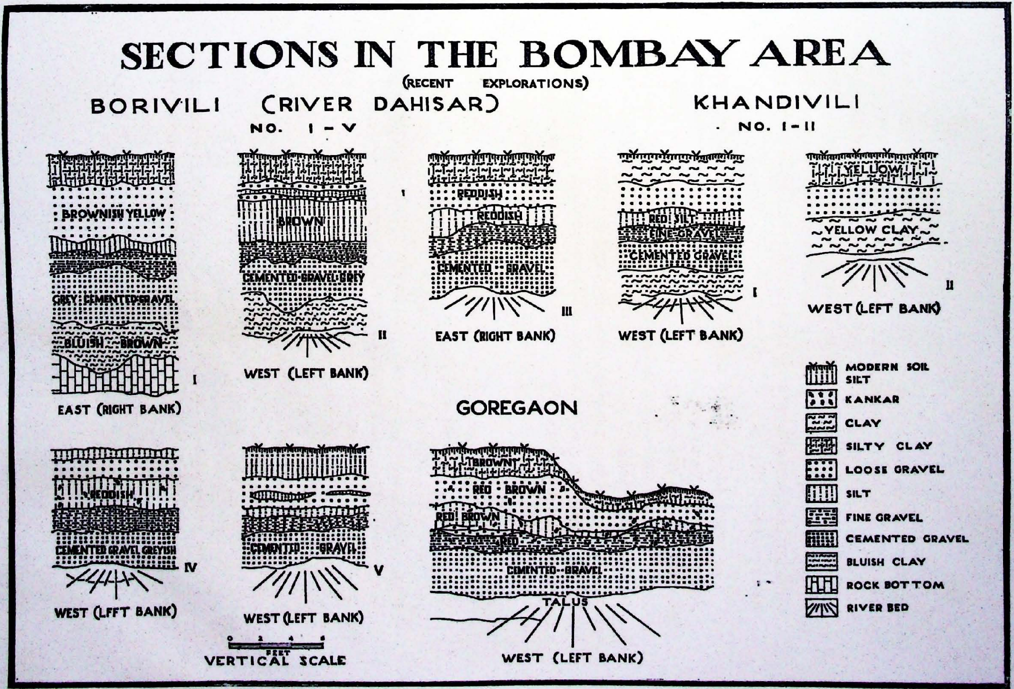

Fig. III. Sections in the Bombay area (Recently explored)

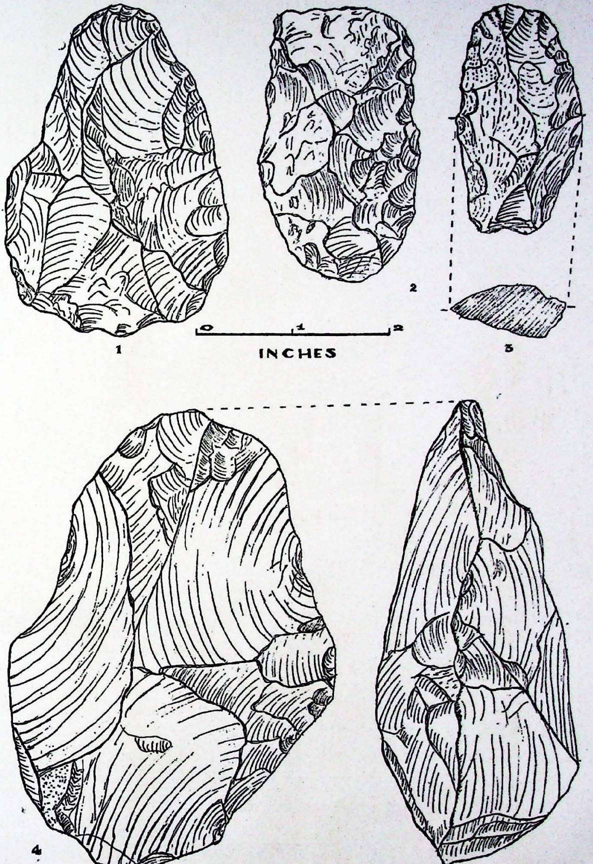

Fig. IV. Palaeoliths from the Bombay area (Khandivli). (*After*)
1 and 2. Hand-axes. 3. Cleaver. 4. Ovate. (*Todd.*)

Fig. V. Type section (Todd's) of Khandivli and of the river Narmada at Hoshangabad and a few typical tools of the 'Middle Stone Age' (*Courtesy 'Personality of India'*).

habited by the Aarey milk colony. But here the intervening small silt layer of Borivli is replaced by a brownish silt about 2-3 feet which lies on a red kankari gravel equating with the fine gravel of Borivli. (Fig. III).

Borivli has so far yielded only few examples of this " smaller " industry from the base of the Upper Gravel. The top of the Lower cemented gravel has yielded one ' chopper ' definitely showing use. Other examples come from the washed out material in the river bed and, curiously, on the slopes and tops (terraces ?) of the hills flanking the west bank of the river. Goregaon has given a ' flake-core ' from top of the Lower Gravel and a core of the " smaller " industries from the Upper Gravel with a few flakes and blades in it. The rest are from the river bed. Khandivli, as already referred to, has given examples of a ' flake-blade-scraper ' industry from the Upper Gravel and microliths from the surface.

A mile west from the Buddhist site of Sopara and fifteen miles north of Khandivli, at Nala Sopara, several examples of this " smaller " industry of scrapers, blades, borers and points were found on the slopes of a hill buried in washed down material—overlying a ' cemented ' gravel. An example of a pointed hand-axe and several larger flakes were also found. This was not in a stratified deposit and tools were buried in a gravel deposited in reddish earth—perhaps lateritic.

In the Bombay area, Microlithic sites are invariably found on top of hills or on considerably higher ground than the surrounding plains, overlooking water-pools or lakes. This is also confirmed by the coastal sites of the Bombay area.[1] A selected number of types which were collected recently (Fig. XIII) from the latter sites, have also been mentioned. Mahableshwar is situated at a height of 4,717 ft. above sea level and the sites in that area are situated in open patches of the jungle, which were probably camping grounds. The neighbouring site of Panchgani is at about the same level but there, the tools are found on the plateau and in front of small rock shelters. Microliths are strewn over a considerable ground among the coastal sites but at the inland sites the area of distribution is restricted.

1. TODD, K. R. U., 1950—" The Microlithic Industries of Bombay ", *Ancient India No. 6.*

TYPOLOGY

A general category of types can be evolved from the study of this collection of the Microlithic industries and the 'Middle Stone Age' industries. The types defined are common to most of the sites mentioned here, and also common to other sites in India. These terms have acquired a conventional meaning although some definitions may be based only on the form, or technique, or function, or the combination of any of these criteria. The conventional term comes to stay even if it is inadequate in describing the type and gives a good idea as to what one is referring to. For instance, the term transverse-arrow-head is based on the function of the implement but the form can be of a lunate, trapeze or even a triangle : the latter terms indicating only the shape. Therefore, although the present system may seem inadequate specially for the classification of the microliths, it is not considered necessary to evolve a new terminology and create rigid categories. This would be possible only if new and different techniques representing different technological traditions were to be discovered. The terms Geometric (Essentially having the triangle and the trapeze) and Non-geometric not only indicate the shape but through convention, also connote the difference in techniques.

Types in the 'Middle Stone Age' :

The tool size taken for this industry is over one inch in length and, averages between two to five inches. The material available in the Bombay area is of a poor quality and mainly consists of jasper and cherty material.

The 'prepared' or the 'facetted' platform technique is present in this industry as is also in evidence from other areas such as Maheshwar[1] and Nevasa.[2] However, statistical analysis was not possible since the collection was not large enough. An analysis of small collections can be very deceptive in its results and interpretations.

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1. Subbarao, B., 1956—op. cit.
2. Sankalia, H. D., 1956—op. cit.

The most important and frequently occurring main type in this 'flake-blade-scraper' industry is the Scraper. This type with its sub-types is a very handy, easily made tool utilized for scraping, cleaning, as a 'spoke-shave' etc. It is an ever-ready all-purpose tool of the 'Middle Stone Age' man. The categories can be subdivided on the type of retouch and whether made on a blade (parallel-sided flake), flake (neither a blade nor an irregular chip) or on an irregular chip. Each category can be further qualified as to whether it has a thin or thick cross section—wherever such a qualification is possible or necessary. Following are the types :—

Side scraper :

In this a single side (length) is retouched to form the scraping edge. Fig. X, 19, 20, 21 : XI, 27 : and Fig. XVII, 19, 20, etc.

Double-side scraper :

The two lengths or sides are retouched. Fig. IX, 2 and Fig. XVIII, 24, 27, etc.

Both these types can take any shape depending on the kind of flake or blade chosen and, also on the retouch. The common shapes noticeable are the triangular (Fig. XVII, 10) or heart-shaped (Fig. XI, 26), besides the other shapes. These shapes suggest that the tools were hafted and used.

Semi-circular scraper or "D"-shaped scraper :

In this, a more or less straight side opposes the convex retouched side which is functional. Fig. XVII, 16, 21 etc.

Circular scraper :

The flake is retouched all around the periphery and is circular, or nearly so. Other scrapers sometimes can be included in this category which are not quite circular but have retouch all around. Fig. X, 16 : XI, 22 : XVIII, 29, etc.

Concave or the "hollow" scraper :

The retouched functional side is concave or "hollow". It may be a shallow or deep concave side worked along the entire length or, only partially.

(i) Single "hollow"—One side retouched. Fig. IX, 5 etc.

(ii) Double "hollow"—Retouched on two sides. Fig. IX, 4, etc. The "hollow" scraper is used as a spoke-shave.

(iii) Strangulated or constricted—when the concave retouch is restricted to the middle of both the lengths of the blade or flake and it also forms a double 'spoke-shave'. Fig. XXVIII, 1.

End scraper :

In this, the shorter side or sides of a flake are retouched to form the scraping edge. The sub-types are similar to the Side-scraper varieties *viz.* ;—Single-end scraper, Double-end scraper or the "hollow"-end scrapers. Fig. XII, 34, 36, 38, etc.

Scraper-cum-point or borer :

It is actually a Double-side scraper concavely retouched, or may be retouched twice concavely on one side. The retouched parts meet to form the point or the boring end which may also be retouched. The working may also be done at one end of the flake. This type very frequently occurs in this industry. Fig. IX, 6 : X, 23, 25, etc.

Side-End, Double-End-Side-scrapers, etc. :

In this category are included all those combinations of the different categories of scrapers, for instance, the combination of the Side and End scraper, or the "hollow" and End or Double-Side-End scraper etc. Fig. IX, 7, 9 : XII 37 : XVIII, 28, 31, etc.

Notched scrapers :

All the aforesaid categories of scrapers, with the probable exception of the Scraper-cum-point, may have notches, *i.e.*, a single blow or slightly retouched notch, on the usual scraper, which is used for hafting or for a grip. The notch may be on one side or both the sides or may be in the middle of the flake and thus accordingly :—

(i) Single notch scrapers : Fig. X, 13 : XIX, 44.

(ii) Double notch scrapers : Fig. XIX, 42, etc.

Steep scrapers :

This category of scrapers involves a steep retouch. But the main types and sub-types are the same as those with the ordinary retouch already described *viz.* Steep-side scraper (Fig. XVIII, 33, 35) or Steep-end scraper etc. (Fig. XIX, 45, etc.)

Nosed or keeled scraper :

Scrapers with a keel or nose or, shoe-shaped scrapers *viz.* : a scraper with steep retouch and thick cross section at one end. Fig. VI, 5, etc.

Burins or gravers :

These are rarely frequented and are, mostly ordinary or the angle-burin types. Fig. XXI, 34 and XXIII 26.

General types in the Microlithic industries :—

The geometric types do not occur as commonly as the non-geometric types which are found along with them. One of the main reasons, probably, being that the finished geometric products of the industry were utilized and, therefore, could not have remained at the sites. These Microlithic industries have a ' macro-facies ', that is, some larger ' flake-blade-scraper ' industry type tools similar to the ones described in the ' Middle Stone Age ' types. The geometric microliths are not absent, but fewer in number. The occurrence of the geometric element and non-geometric simultaneously, is quite logical because, under no circumstances can the entire collection be geometric. This is a truism. There are several sites with a larger proportion of cores in various stages, and these are the factory sites which also yield a large variety of types. Following are the categories :—

Blade :

A parallel sided (or nearly so) flake taken off in a regular fashion such as from a fluted or prismatic core. Fig. XXV, 4, etc.

Micro-burin :

Is a by-product of the geometric microlith such as the triangle and the trapeze. It rarely occurs on these sites or elsewhere in India. The few good examples from the sites in the Satara district do not indicate the prevalence of a similar technique as in the European Microlithic industries. (Fig. XXVI, 1.)

Trapeze :

It is a four-sided geometric form of microlith essentially worked along two sides. Generally hafted and utilized. No typical example from this assemblage.

Triangle :

A geometric microlith with retouch on at least two sides. Hafted and used. (Fig. XXV, 2.)

Lunate :

A blade with one convex side blunted (retouched) opposite a straight functional edge. As the name suggests the shape is like a half moon or a crescent. It can also be made on a flake-blade with either thin or thick sections. The blunted-back edge is hafted. Fig. XXIII, 40, 46 : XXVI, 4, 5 etc.

Backed blade :

A blade blunted along one edge may or may not be hafted depending on its size. Used as a pen-knife blade, mostly hafted. It varies greatly in size (length) and thickness. Fig. XIII, 2, 3 : XXVI, 26, 27, 28 etc.

Blunted back-point :

A blade blunted or retouched along the back and especially at one end to form a point. Hafted and used. Fig. XIII, 4 : XXV, 1.

Points :

These are made on blades or flake-blades by either working from both the edges to form the point or by the removal of a single or more flakes to form a point or a concave-sided point. Fig. XIV, 4 : XXV, 14, 20 : XXIV, 32 and Fig. XXVI, 45, 46 etc.

Asymmetrical point :

The sharp point is obtained by obliquely backing one of the sides of a thick flake with a midrib. This type, although absent from these sites, is mentioned because it is an important type in some of the Indian microlithic sites, viz., Langhnaj. Fig. XXV, 1. (?)

Awl :

It is really a borer made by the elaborate retouch all over the tiny flake and especially at the functional end. The circular base suddenly tapers into a point. This type also occurs in the Mahi valley Microlithic industries. Fig. XIII, 31.

Notched flakes :

Flake-blades with notches

(i) at the base or at one end. Fig. XIII, 6 and XIV, 1;

(ii) in the middle of the flake-blade due to a vertical blow ending in hinge fracture : or just a notch in the middle. Fig. XIII, 7 and XIV, 6 and 7.

The exact function of this tool cannot be directly ascertained but the notch which is easily made was probably used to help in hafting. It is commonly found at other sites in India.

Scrapers :

Most of these types are similar to the ones occurring in the ' Middle Stone Ages '.

(i) Notched-Single-Side. Fig. XXI, 31, 32 : XXVII, 35.

(ii) Notched, with Double-Side ' concave ' scraper. Fig. XXIV, 28, 38.

(iii) Single-Side scraper. Fig. XXI, 36 : XXIV, 40.

(iv) Double-Side scraper. Fig. XXVII, 62.

(v) Circular and Semi-circular scrapers. Fig. XXI, 27, 28.

(vi) End scrapers : (a) Single-End. Fig. XX, 33-35 : XXVI, 11 : XXVII, 50-52.

(b) Double-End.

(vii) Keeled scraper. Fig. XX, 15 : XXIV, 35.

(viii) " Hollow "-End scraper—' spoke-shave '. Fig. XXVII, 54.

These scrapers can all be worked by a steep retouch (Fig. XVII, 15, " insitu " : XXIV, 27, 30, 31, 33 etc.). The elaborate working may give triangular or heart shapes (Fig. XXIV, 20, 24) or other distinctive shapes and can be named as such.

(ix) Thumb-nail scraper—a small circular scraper worked all around. Fig. XXVII, 41.

The Side-End (Fig. XVII, 6 ' insitu ' : XX, 13 : XXVII, 58) : Scraper-cum-point (Fig. XIII, 12, 18, 40) or, the Borer (Fig. XX, 12) etc. are also found. Thick flake-blades with slight retouch and used ; utilized blades and flakes and flakes which are not utilized are also found in a good quantity. (Fig. XVII, 11 "insitu" : XXVI, 15-25). There are a few doubtful burins. Examples of tanged point (Fig. XIII, 5), and transverse arrow-head (Fig. XIII, 35) are also found.

Cores : (See also Fig. XXV).

These have been regularly worked and are classified as

(i) Single-platform. Fig. XIV, 17, 18, 19, 20 : XXII, 38-45, 38 is " insitu ".

(ii) Double-platform. Fig. XIV, 14, 21 : XXII, 46-48.

(iii) Irregularly (or more than two platforms,) worked cores.

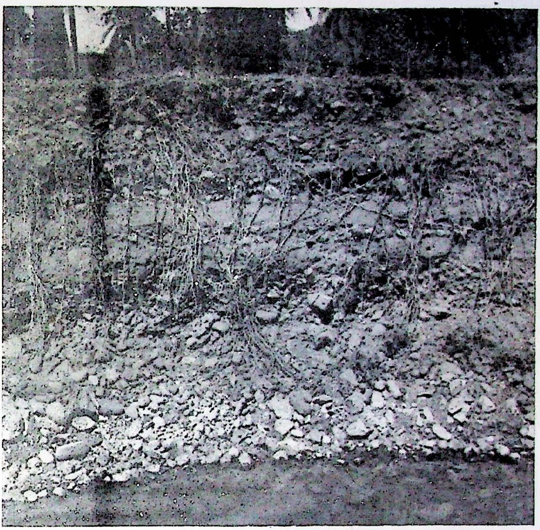
Core tools :

The remains of cores retouched to form tools ; or remains of cores simply used.

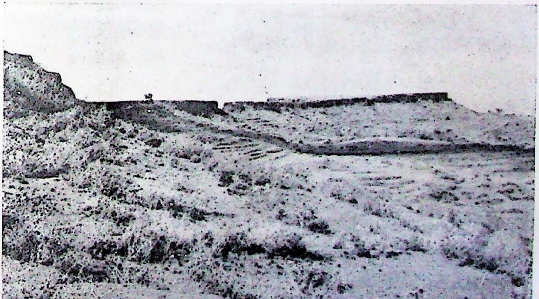
(i) Disc-core circular scraper. Fig. XIV, 24.

(ii) Semi-circular and long core scrapers. Fig. XXI, 50, 53 : XIV, 25.

(iii) Double-End disc-core scraper. Fig. XVIII, 34 " insitu " : XXIII, 45.

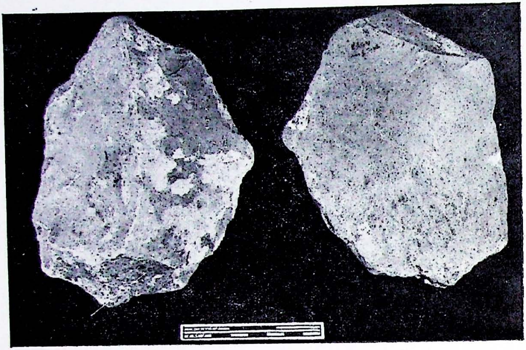


A



B

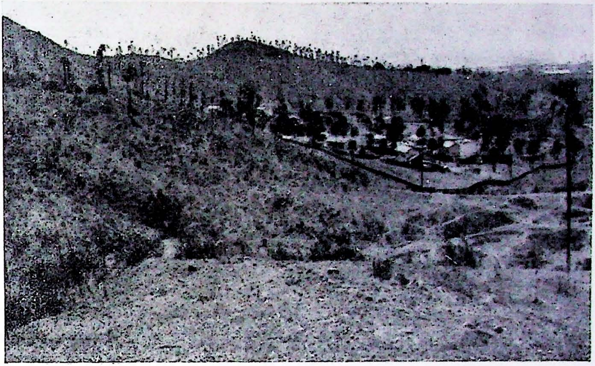
Plate IV A. Ghodbunder section.
B. Panchgani plateau.



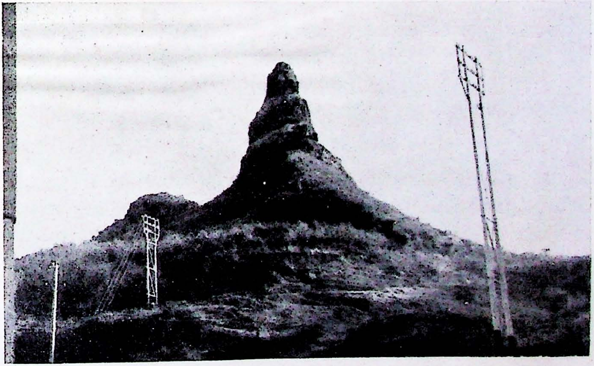
A

B

Plate V A. Flake-core from Goregaon, "*in situ*".
B. Hand-axe from Nala-Sopara.

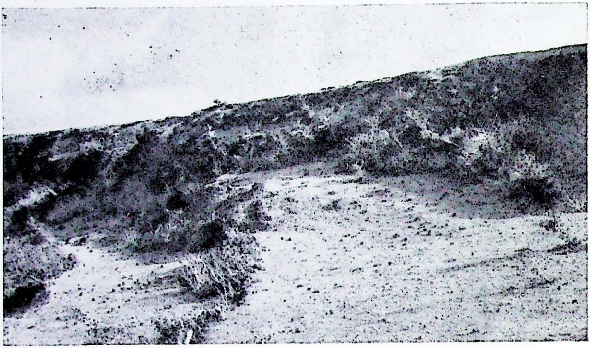


A

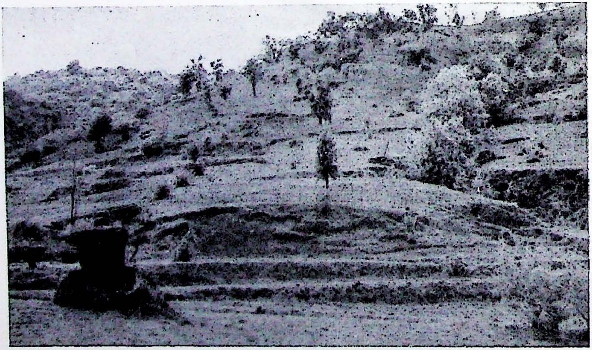


B

Plate VI A. Chembur.
B. Parsik

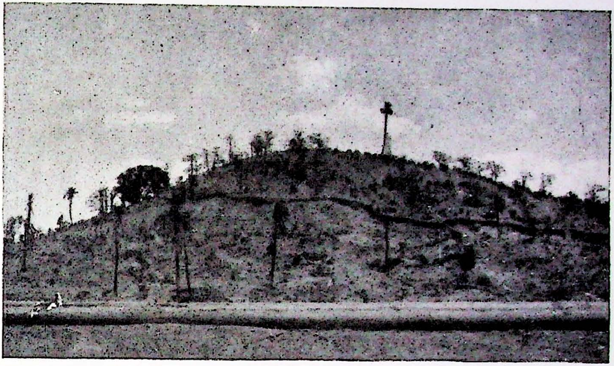


A



B

Plate VII A. Panchgani plateau with rock-shelter on the right.
B. Ambenali.



A

B

Plate VIII A. Saki-naka.
B. Powai-lake.

THE SITES

Bombay :

(1) Bandra (Pali hill) :

This is Todd's coastal site. Microliths are found on the hill which has been quarried considerably. The remaining portion of the hill yielded some microliths. Towards the west, on the coast side, is the old golf ground. Here, artificial mounds yielded microliths of agate and carnelian along with few sherds of the Red-Polished ware, weathered. But these have apparently been dug from the original mound and brought to the golf course. Because of the habitations in the area it was not possible to locate the original mound.

(2) Yerangal : **(3)** Madh : **(4)** Versava ; and **(5)** Manori point :

These are also the microlithic sites of Todd, situated on neighbouring islands about 27 miles north of Bombay. These sites are situated on low hills or mounds overlooking fresh water pools collected during the monsoons. The sites are abounding with microliths and a few interesting types have been illustrated (Fig. XIII). Yerangal (Yrl) is the most important site because it yields a good variety of the geometric and non-geometric microlithic types.

(6) Pokhran : **(7)** Vihar lake :

These are also Todd's sites which overlook the lakes—Vihar and Pokhran. Pokhran yielded an insignificant number of microliths but Vihar proved to be quite barren.

(8) Bassein and **(9)** Nirmal : **(10)** Sopara and **(11)** Nala Sopara :

These are neighbouring sites on the west side of the two railway stations—Bassein and Nala-Sopara, about 35 miles north of Bombay city. Between Nirmal and Bassein (Nmbsn Fig. IX, 1 : XI, 23 : XII, 29) on the east side of the road connecting the two, some microliths and flakes were found in the fields. The Nala Sopara site is located on an isolated hill which has been quarried. This hill yields

'Middle Stone Age' tools from the reddish loose gravel overlying the 'cemented' gravel.

Following are the types from Nala Sopara : (Nlsp. Fig. VI and VII).

(i)	Side-scraper	6
(ii)	Borer-cum-scraper	2
(iii)	Nose-scraper	1
(iv)	Steep 'shoe-shaped' scraper	1
(v)	End scraper	2
(vi)	Notched scraper	1
(vii)	Utilized blade	1
(viii)	Large (4-5″) flake	1
(ix)	Pointed Hand axe. (?) ..	1
	Total	16

(12) Ghodbunder : (Gdbr. Fig. IX, 9 : X, 22 and Fig. XI, 26)

This site is situated six miles north of Borivli and four miles east of Mira Road railway station, on a tributary of the Ulhas river. The six feet sections show a Lower cemented gravel separated from the Upper loose gravel by a silt layer. The loose gravel is topped by silt and modern land surface. One flake-blade was recovered from the Upper gravel and some very much rolled flakes and an extremely rolled hand axe from the river bed.

(13) Borivli : (Brvli : Fig. IX to XII) :

Explorations were carried out along the river Dahisar and on the hill west of the river upstream. The hill surface yielded several good examples. A couple of specimens were also found in the Upper gravel of the upper aggradation. Following are the types :—

(i)	Notched scrapers-cum-borer	3
(ii)	Steep End-scrapers-cum-point	2
(iii)	Circular scraper	1

(iv)	Steep Side-scraper-cum-point	1
(v)	Side-scrapers on blade-flakes	2
(vi)	Triangular shaped scrapers, with notch ..	2
(vii)	Scraper-cum-point	2
(viii)	Double-side scrapers	5
(ix)	Concave " hollow " scraper	1
(x)	Double " hollow " scraper-cum-point	5
(xi)	Side-scraper-cum-point	4
(xii)	Side scrapers on ordinary flakes	14
(xiii)	Steep Double-end and Side-end scrapers, with notch	5
(xiv)	End scrapers	3
(xv)	Side-end scrapers	3
(xvi)	Steep Side-end scrapers	4
(xvii)	Steep End-scrapers	5
(xviii)	Steep Side-scrapers	3
(xix)	Single platform microlithic cores	3
(xx)	Chopper (?)	1
	Total	69

(14) Kanheri Caves :

Here, Black-and-Red and Red-polished ware sherds were found from the restored debris of cave II. Few microliths were found from the surrounding area.

(15) Khandivli (Kdvli) and **(16)** Goregaon (Grgn) :

As has already been noted, Khandivli has yielded specimens from the upper aggradation and microliths from the surface. (Fig. VII, VIII and XIII) At Goregaon (Fig. VII and VIII) was found one slightly rolled flake possibly used as a side scraper, a flake 3½"–5"–(of chert from the base of the Upper gravel : it is a large pebble retaining cortex at the base, with whitish patination) and a ' flake-core ' (of light brown chert fresh in condition found on top of the Lower gravel, in the Fine gravel. It is a flake with a prominent bulb and a high angled platform.

Lime concretions are formed on the upper surface where the flake scars remain). The shape of the upper surface is like the top of a tortoise.

(17) Powai Lake-Saki-Naka (Pysn): (Fig. XIII):

This site is situated in the area surrounding the Aarey milk colony, two miles east of Andheri. Marol and Saki-Naka are the two villages from where Powai lake is approached. Nearly two square miles of the area is strewn with microliths on the hill tops. It is significant to note the restricted distribution of microliths on the hill tops or on their slopes, but rarely on the plains below :

Following are the main types :—

(i)	Backed-blade	1
(ii)	Backed-blade with concave functional edge	1
(iii)	Triangles	2
(iv)	Utilized blades	13
(v)	Flakes with notches	3
(vi)	Serrated-edge blades	2
(vii)	Side scrapers on flake-blades	2
(viii)	Utilized, backed-flake	1
(ix)	Point, with utilized edge	1
(x)	Single platform cores	9
(xi)	Double platform cores	6
(xii)	Irregular cores	5
(xiii)	Utilized core scrapers	8
	Total	54

(18) Pachkoli caves : (Pck) (Fig. XIII) :

These are the caves belonging to the Buddhist period, situated on a hill overlooking the Aarey milk colony and neighbouring sites of Pysn. On top of this hill and caves, microliths were found.

Following are the types :—

(i)	Backed-blades	2
(ii)	Awl	1

(iii)	Utilized blades	2
(iv)	Flakes with notches	4
(v)	Side-scrapers on flake-blade	3
(vi)	Double-side scraper	1
(vii)	' Prepared ' platform, Scraper-cum-point ..	1
(viii)	Double " hollow " scraper-cum-point	2
(ix)	End-scraper	1
	Total	17

(19) Kurla hill and **(20)** Chembur (Chmr. Fig. XIV) :

The Chembur site is located on a hill that is being quarried near Trombay and Kurla hill which is just behind the Tata workers' quarters. Chembur yields geometric microliths and a red-washed weathered pottery but, their association is not established. The height of the hill is considerably higher than of the sites already mentioned. Following are the types :

(i)	Notched-blade, utilized	1
(ii)	Lunates	2
(iii)	Triangles	2
(iv)	Utilized flake-blades	8
(v)	Blades, with notches in the middle	3
(vi)	Blades, with notches not in the middle	2
(vii)	Thick backed-blades	3
(viii)	Steep End-scraper	1
(ix)	Deep, concave-side, ' hollow ' scraper	1
(x)	Keeled End-scraper	1
(xi)	Single platform cores	4
(xii)	Double platform cores	3
(xiii)	Irregular cores	1
	Total	32

(21) Parsik (Prsk):

It is located on the Bombay-Poona road just beyond Thana on a 'needle' top hill overlooking the Thana creek and the railway line. Only one Side-scraper and a core was found.

(22) Vajreshwari (Vjri) area: (Fig. XV and XVI):

This site is about 48 miles from Bombay and is located along the banks and the area around the tributary of the Tansa river. Vajreshwari is famous for its hot springs reknown for their healing power. Around this area and in the fields a small collection was made of microliths and also some larger tools. The river section showed a gravel layer topped by layer of sandy clay. These layers constitute a recent geological deposition and proved barren. Following are the types :—

The 'macro-facies':

(i)	Green and brownish, nodule of jasper (4" length)	1
(ii)	Dark green jasper, Double-side scraper (2" length)	1
(iii)	Rolled, large used flake. (2" length)	1
(iv)	End-scraper (1" length)	1
(v)	Steep End (or Side) scraper, of Agate (1" length)	1
(vi)	Battered and rolled flake, of agate. (1" length)	1
(vii)	Somewhat used flake, of chalcedony (1" length)	1
(viii)	Side scraper on large (3-4" length) flake with scars, retouch and use, on one side	1

Microlithic :—

(ix)	Rolled, used flake	1
(x)	Used, green light jasper, blade and other used blades	5

(xi)	Disc-core scrapers	6
(xii)	End-scraper of red jasper flake (3/4" length) ..	1
(xiii)	Slightly concave scraper	1
(xiv)	Steep core-scraper	1
(xv)	Lunate	1
(xvi)	Core	1
(xvii)	Flake Double-side scraper	1
(xviii)	Waste flakes	23
	Total	49

In the above assemblage of the microliths of Bombay area, we find, the presence of a 'macro-facies', *i.e.* element of the 'flake-blade-scraper' industry.

Satara :

Following are the sites in this area :

(23) Mahuli : (Fig. XVII to XIX Mhls)

It is located on the Krishna river, 2-3 miles from Satara town. The river sections are about 20-25 ft. in height and their sequence from bottom upwards is; gravel slightly cemented, fine gravel and, 10-15 feet of silt followed by the land surface. These sections are opposite the banks on which the temples are situated. From top of the Cemented gravel and in the fine gravel, microlith-like flakes, broken or snapped blades and a steep End-scraper were found. From the river bed 'Middle Stone Age' industry tools were found. Microliths were also found in the recent dark top soil. In the following types, the ones that are microlithic are mentioned, the rest belong to the 'Middle Stone Age' industries :—

(i)	Snapped, utilized blades and flake-blades (Microlithic)	15
(ii)	Side-End scraper, with a notch	1
(iii)	Utilized flake-blades (Microlithic)	3
(iv)	Scrapers-cum-points, triangular shaped ..	5
(v)	Side-scrapers with serrated edges	2

(vi)	Steep Side-end-scraper	1
(vii)	Steep Side-scraper	6
(viii)	Side-scrapers on flake-blade	6
(ix)	Side-scrapers on thick flake-blade	4
(x)	'D'-shaped scrapers	8
(xi)	Side-end-scrapers	9
(xii)	Double-Side scrapers	2
(xiii)	Scraper-cum-borer (Prepared platform) ..	1
(xiv)	Double-Side scrapers, forming point	3
(xv)	Steep-scrapers, worked all around	4
(xvi)	Steep End-scrapers	5
(xvii)	Single-notch scrapers	4
(xviii)	Double-notch scrapers	2
(xix)	Double-end steep scrapers	3
(xx)	Steep Side-End scrapers	3
(xxi)	Single platform cores (Microlithic)	5
(xxii)	Double platform cores (Microlithic)	5
(xxiii)	Core-disc Scrapers (Microlithic)	3
(xxiv)	Core-End Scrapers (Microlithic)	15
	Total	115

(24) Wai : (Ykn. Fig. XX to XXII) :

It is situated on the Krishna river, upstream from Mahuli, near a bridge on the Poona-Mahableshwar road. The river section is about 10-15 feet in height, in which, a lower gravel is topped by the silt and modern land surface. A tributary nala also shows a similar section and yields from top of the lower gravel a core belonging to the Microlithic industries. On the modern land surface and in the fields innumberable cores, flakes, and a variety of tools of the Microlithic industries were found. Black-and-Red ware sherds were also found on the opposite bank unassociated with microliths, and probably indicate a Satavahana site in the neighbourhood. Wai is mainly a microlithic site. Following are the types :—

(i)	Utilized blades	22
(ii)	Utilized flakes	19
(iii)	Blunted-back thick blades	3
(iv)	Blunted-back thin blades	3
(v)	Blades retouched from both the edges to form a point	3
(vi)	Large-backed-blades	2
(vii)	Partially backed-blades to form points ..	2
(viii)	Scrapers on blades	3
(ix)	Notched-Scraper on flake	1
(x)	Circular scrapers	3
(xi)	Flakes retouched to form a point	3
(xii)	Side-End scrapers	2
(xiii)	Steep-End scraper	1
(xiv)	Side-End scraper with notch	3
(xv)	Double-side scraper with a keel	2
(xvi)	Flakes slightly retouched and utilized	3
(xvii)	Side-scraper on flake-blade	17
(xviii)	' D '-shaped scraper	1
(xix)	Heart-shaped Side-scraper	6
(xx)	End-scraper (cum-burin ?)	1
(xxi)	Scraper worked all around	3
(xxii)	Blades worked into a point	2
(xxiii)	' Hollow ' Concave scraper	1
(xxiv)	Points or borers with little retouch	3
(xxv)	Notched scrapers	3
(xxvi)	Double-Side-and-End scrapers	4
(xxvii)	End-scrapers	6
(xxviii)	Single platform cores	35
(xxix)	Double platform cores	9
(xxx)	Irregularly worked cores	5

(xxxi)	Core scrapers	16
(xxxii)	Core disc-end scrapers	7
	Total	194

(25) Panchgani : (Pnck. Fig. XXIII) :

A microlithic site on the Panchgani plateau. Microliths are also strewn outside a small rockshelter. It is about 12 miles before one reaches Mahableshwar and at about the same height above sea level as Mahableshwar. Following are the types :—

(i)	Backed-blade-cum-point	4
(ii)	'Larger' backed-blades	2
(iii)	Backed-blades with 'S' twist	1
(iv)	Backed-blades with retouch on the concave side	1
(v)	Utilized blades and flake-blades	31
(vi)	Flake-blades with notches	2
(vii)	Scraper-cum-point	2
(viii)	'D'-shaped scrapers	4
(ix)	Points	3
(x)	End-scrapers	5
(xi)	Side-End scrapers, snapped	3
(xii)	Triangular-shaped Side-scrapers	3
(xiii)	Cores	8
(xiv)	Burin :—'bec-de-flute-'	1
(xv)	Core, End-and Side-scrapers	15
	Total	85

The sites in the Mahableshwar area :

It has several sites of the Microlithic industries located within its precincts. These sites are found on open patches or areas deprived of the woody jungle growth and on which at one time tribal people, perhaps, camped. Microliths were discovered after the first light monsoon showers.

No pottery is associated with any of these sites but at one site a core made from a broken piece of an old beer bottle was found. This find is more significant than the association of pottery with the microliths because it shows that Microlithic peoples existed very late into historical times.

Most of the Mahableshwar sites are within 4-5 miles from the centre of the town, except the site of Pratapgarh and its neighbouring sites which are in the valley. Following are the sites with the types :—

(26) Helen's point : (Hln. Fig. XXIII) :

(i)	Backed thin flake-blades	2
(ii)	Utilized blades	4
(iii)	Completely backed-blades	2
(iv)	Double-Side scraper, triangular shaped	1
(v)	Steep Side-End scraper	1
(vi)	Side Straper..	1
(vii)	End-scraper	1
(viii)	Notched scraper	1
(ix)	Core	1
	Total	14

(27) Baghdad Point : (Bgd. Fig. XXIII) :

(i)	2/3" long Lunate-cum-point	1
(ii)	Utilized flake	1
(iii)	Core	1
	Total	3

(28) Golf course : (Glf. Fig. XXIII) :

(i)	Backed-blade	1
(ii)	Double-platform core	1
(iii)	Core-scraper	1
	Total	3

(29) Pratapgarh : (Prtg. Fig. XXIII) :

This site is situated at the base of the Pratapgarh fort in the open ground in front of the Rest House. It is almost a 1,000 feet lower in height than Mahableshwar —as one comes down the Fitzgerald ghat on the Mahableshwar-Mahad road. Following are the types :—

(i)	Snapped blades retouched at the snapped end and backed	2
(ii)	Utilized flake-blades	9
(iii)	Small broken backed-blades	3
(iv)	Points	2
(v)	Side-scraper	1
(vi)	Cores	7
(vii)	Core scrapers	2
	Total	26

(30) Panchgani Road :—(Pngn. Fig. XXIII) (Five miles from Mahableshwar going to Panchgani just off the main road) :

(i)	Lunate	1
(ii)	Backed flake-blade	1
(iii)	Utilized blades	3
(iv)	Cores	3
(v)	Core scraper	1
	Total	9

(31) Rishi's caves :—(Rsc. Fig. XXIV) :

This site is in the Mahableshwar area. The caves are not really caves but hollows in rocks. Microliths are found in the open grounds around these 'caves'. Following are the types :—

(i)	Backed-blades-cum-point	5
(ii)	Utilized backed blades	4
(iii)	Notched blades-snapped	10

(iv)	Thin backed-blades-snapped	8
(v)	Triangle	1
(vi)	Triangular shaped points	2
(vii)	Notched blunted back	1
(viii)	Utilized blades..	15
(ix)	' Larger ' utilized backed-blades	4
(x)	' Larger ' backed-blades	8
(xi)	Notched flake-blade	1
(xii)	Notched scraper	3
(xiii)	Notched-End scraper	1
(xiv)	Double-notched flakes	2
(xv)	Side-scrapers with notches	5
(xvi)	Scrapers	3
(xvii)	Scrapers on flake-blade nearly triangular shaped	10
(xviii)	Double Side-scraper with a notch	3
(xix)	Semi-circular scraper	5
(xx)	Flake—broad and flat—ending in a point ..	1
(xxi)	Concave sided point	2
(xxii)	Flake-blade with both edges retouched to form a point	3
(xxiii)	Steep End-scraper	1
(xxiv)	Keeled End-scrapers	3
(xxv)	Thumbnail scraper	1
(xxvi)	Steep Side-End-scraper	3
(xxvii)	Double-Side-End-scraper	2
(xxviii)	Steep Side-scraper	4
(xxix)	Steeply backed-flakes	4
(xxx)	Single Side-scraper	1
(xxxi)	Scrapers with retouch all around	4
(xxxii)	' Hollow ' concave-Side scraper	1

(xxxiii)	Double ' hollow ' scraper-cum-point	1
(xxxiv)	Scraper-cum-point	1
(xxxv)	Scraper forming point	1
(xxxvi)	Single platform cores	24
(xxxvii)	Irregular cores	10
(xxxviii)	Core scrapers	8
	Total	166

(32) Talechamet :—(Tmt. Fig. XXV) :

This is also situated along the Mahableshwar-Mahad road—which leads to Pratapgarh—but is very near (3 miles) Mahableshwar. It was here that the glass core was found. Following are the types :—

(i)	Oblique point (?)	1
(ii)	Scalene triangles	2
(iii)	Lunates	2
(iv)	Thin long parallel blades	2
(v)	Thick backed-blade with 'S' twist (Fig. XXV, 7)	2
(vi)	Notched blade with a snapped point	1
(vii)	Utilized blades	34
(viii)	Triangular shaped Side-scrapers	3
(ix)	Broken backed-blades	2
(x)	Scraper with serrated edge	1
(xi)	Scraper with elaborately worked surfaces (Fig. XXV, 15)	1
(xii)	Reject flake made into a point	1
(xiii)	Backed-blade	1
(xiv)	Triangular scraper with a point ; worked all around	1
(xv)	End-scraper	1
(xvi)	Steep End-scraper	1
(xvii)	Steep disc-core scraper	1

(xviii)	Single platform cores	11
(xix)	Double platform cores	6
(xx)	Irregular platform cores	3
(xxi)	BOTTLE GLASS Core well worked (Fig. XXV, 27)	1
	Total	78

(33) Ambenali-Jaoli :—(Amj. Fig. XIV, XXVI and XXVII) :

This site is spread over a considerable area comprising the two villages of Ambenali and Jaoli. The former is near the Mahableshwar-Mahad road and in the neighbourhood of Pratapgarh but the latter is further inland from the road. It is a very rich site and is at the base of a hill near the village of Ambenali whereas at Jaoli the microliths are distributed in the fields. The material is mainly agate and chalcedony of a good quality. The microliths from Ambenali are concentrated in a smaller area and from the quantity and number of cores in various stages, it is considered, definitely, to be a factory site. It is also considered worthwhile to excavate in this area. Following are the types :—

(i)	Micro-burin	2
(ii)	Backed-blade-cum-point	2
(iii)	Backed-blade with irregular working edge	1
(iv)	Lunate on a thin flake	1
(v)	Thick blunted-back lunate	1
(vi)	Partially backed-blade forming a point ..	1
(vii)	Snapped blunted-back blades	5
(viii)	' Larger ' backed-blades	4
(ix)	' Larger ' backed-blades—snapped	6
(x)	End-scraper on blade	1
(xi)	Blades, retouched on either edges (to form point ?)	2
(xii)	Triangles with retouch on all the three sides	2
(xiii)	Steeply backed thick blades	2
(xiv)	Tiny flake retouched to form point	1
(xv)	Slightly retouched and utilized flake-blades	68

(xvi)	Utilized flake-blades—snapped	37
(xvii)	Utilized flakes	45
(xviii)	Spalls and reject flakes	31
(xix)	Elaborately backed 'larger' blades	17
(xx)	Flake-blades, notched at one end..	9
(xxi)	Flake-blades, notched in the middle	4
(xxii)	Notched scraper	1
(xxiii)	Triangular shaped Side-scrapers	3
(xxiv)	Double Side-scrapers triangular shaped ..	2
(xxv)	Circular scrapers	5
(xxvi)	Points with slight retouch and utilized ..	15
(xxvii)	Point-cum-scraper	9
(xxviii)	Steep End-scraper	8
(xxix)	Steep End-scraper with a keel	1
(xxx)	Steep-End circular shaped scraper	1
(xxxi)	'Hollow' spoke-shave—End-scraper	1
(xxxii)	Ordinary End scrapers	2
(xxxiii)	Steep Side-End scrapers	4
(xxxiv)	Irregular shaped flakes utilized as scrapers (Fig. XXVI, 60)	9
(xxxv)	Backed blades	5
(xxxvi)	Thick squarish Side-scrapers	5
(xxxvii)	Semi-circular scraper	1
(xxxviii)	Double-Side scraper	1
(xxxix)	Side-End scrapers	2
(xxxx)	Side-End scrapers with a notch	2
(xxxxi)	Single platform cores	41
(xxxxii)	Double platform cores	2
(xxxxiii)	Irregular cores	9
(xxxxiv)	Disc Core scrapers	9
(xxxxv)	Disc-End Core scrapers	7
	Total	387

CONCLUSION AND CHRONOLOGY

The Lower Palaeolithic or the 'Early Stone Age' :—

Todd, in his Khandivli sections found this Lower Palaeolithic complex beginning with the Clactonian in the Lower Clay, Chellean-Clactonian in the Lower Gravel and ending with the Late Acheul—Clacton group on top of the Lower Gravel. (Fig. V). These industries—Todd's Clactonian and Chelles-Acheul complex—were conspicuously absent from the present collection excepting a few doubtful specimens. Therefore, no fresh conclusions can be drawn regarding the first stage of the Stone Ages in this area excepting those already arrived at by Todd. His 'flake-blade-scraper' industry begins on top of the Middle Clay and ends as the 'blade and burin' industry at the base of the Upper Clay. This is the 'Middle Stone Age' industry.

The 'Middle Stone Age' or the 'flake-blade-scraper' industry :—

An independent consideration of the Indian Stone Ages—ignoring to look for parallel sequences like that of Europe and Africa—focuses the attention on this gap that exists between two distinct technological traditions, that is, the Lower Palaeolithic and the Microlithic industries of India. Insufficient investigation is the reason for the existence of this gap, till recently, unless one explains it by the outmoded hypothesis of the migration of two culturally different peoples separated by a time gap. Technological and cultural changes are gradual whether they take place by diffusion or independent invention. Thus, adjusting itself to the Indian environment we find this intervening stage of the 'flake-blade-scraper' industry homo-taxial to the stage in the Stone Age sequence of the European and African continents.

The material most often utilized for this industry is flint, chert, chalcedony, jasper, agate and carnelian. The Bombay 'flake-blade-scraper' industries have used mainly an inferior variety of jasper and chert, while the Narmada and Godavari valley industries have used the same materials but of a very fine quality.

This industry in size, is larger than microliths and smaller than palaeoliths. Flakes and blades being numerous could easily be considered as chips of larger tools or utilized waste flakes of a larger industry. But no larger tools are available along with it. Typical tools are the various kinds of scrapers and the points or borers and borer-cum-scrapers. These tool types continue along with their sub-types into the 'Late Stone Age' or the Microlithic industries. The beginning of these scraper types can be seen in the Lower Palaeolithic as for instance, at Nevasa.[1] The non-geometric industries have a fair share of this industry and show their derivation from this 'flake-blade-scraper' industry, as is also indicated, for instance, at Sangankallu.[2] Typologically, it is somewhat similar to the Upper Palaeolithic of Europe. But it has neither the extensive variety of types nor the specialization of types like its European counterpart. Nevertheless, it is an industry intervening between the Lower Palaeolithic and the Microlithic both stratigraphically and typologically. Stratigraphically, this in-between position of the 'middle' industry is not very evident from the pertinent region but is conclusively proved by its 'middle' occurance at Nevasa and Maheshwar. Regarding the chronology of the industry, fossil (Bos namadicus) evidence from Nevasa and evidence from the sites on the Narmada valley gives the dating for the Lower Palaeolithic industries from about the Middle to the Upper Pleistocene and, since the 'Middle Stone Age' industries follow the Lower Palaeolithic, it would not be far fetched to assume the age of this industry as Late-Upper Pleistocene or Early Holocene.

Regarding the absence of this industry in Northern Gujarat, the following brief survey of the Sabarmati, Mahi, Orsang, Karjan, Narmada, and Pravara river valleys explains the gap in that area.

Sabarmati[3] :

This area of Northern Gujarat shows two aggradations. A set of Lower fluviatile layers, resting on a mottled clay bluish in colour similar to the one in the

1. *Ibid.*

2. SUBBARAO, B., 1948—"Stone Age Cultures of Bellary", *Deccan College Dissertation Series No.* 7, Poona.

3. ZEUNER, F. E., 1950—op. cit.

Bombay sections, is separated from the Upper aggradational complex of wind-borne deposits by a Red soil horizon. The height of the sediments, for instance near Hirpura, is about 100-150 feet. Lower Palaeolithic industries are found in the Lower aggradational deposit. But there is a complete cultural blank after this until Microlithic man flourished on top of the sand dunes as revealed by the Langhnaj excavations.

Mahi[1] :

This is the area popularly called Middle Gujarat. It is the southern limit of the semi-arid flat 'loessic' region relieved by lowlying wind-blown sand dunes occuring in large groups between the main river valleys and also along the river banks. Zeuner's[2] work has shown that on the whole this area has less wind activity than North Gujarat. The evidence is from soil analysis; of the gravel lenses present in the wind-borne deposits which are missing in the Sabarmati sections ; and that there are no lime incrustations on bone, wood and stone as on the Sabarmati. The Sabarmati section and industries are repeated here excepting for the climatic differences enumerated.

Lower Narmada[3] :

The intensity of these dry phases recedes as one moves southwards gradually. The successive series of layers are on the whole the same as in North Gujarat, on the river Orsang, near Baroda. But a little to the south near Chandod, where the Orsang enters the Narmada, the river movements dominate the profile and the aeolin sediments disappear.

On the Karjan near Rajpipla, eight miles south of Chandod, two fluviatile series are separated by a brown soil reminding one of a regur horizon (Black soil).

Explorations in these areas have only yielded Lower Palaeolithic industries in the Lower aggradational complex.

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1. Subbarao, B., 1952—op. cit.
2. Zeuner, F. E., 1950—op. cit.
3. Zeuner, F. E., 1953—From a translation of "Das Problem der Pluvialzeiten". *Geologische Runsdchan.* Ed. 41.

Middle Narmada :

"About 300 miles downstream on the Narmada" there is more evidence for this "smaller" industry. "Tools are found in the cliff sections as well as at the foot of the Vindhyas, in the vicinity of the veins of jasper exposed near the foot of the hills on either side of the river.[1]" Tools are also found in the river beds. But in a stratigraphical context the industry is associated with the Basal gravel and Black soil group. This group lies beneath the Protohistoric debris. Numerous specimens of this industry were found recently,[2] in the Basal gravels in addition to the Acheulian handaxes and cleavers, etc.

Upper Narmada :

Hoshangabad, Narsingpur sites are famous for the Palaeolithic finds and fossil animals as worked by Deterra and Paterson[3] and Blanford.[4] There are three groups of deposits; that is, a Lower group, an Upper group and the Black cotton soil group. The last group is the most recent one comprising Basal Gravels with the Black Soil on top. In the Basal Gravel and sands a flake assemblage dominated by small blades and scrapers is found, followed by the Microlithic industries in the Black Soil. This sequence is similar to the one on Middle Narmada.[5] (Fig. XXVIII and XXIX).

Pravara[6] : (A tributary of the Godavari) :

At Nevasa, this industry is found near the protohistoric mound in the Gravel Phase II of the three gravel phases of Nevasa. It forms the Series II of the Palaeo-

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1. SUBBARAO, B., 1956—op. cit.

2. Most recent—1957-58—explorations in the Narmada valley, at Maheshwar by the M. S. University of Baroda. The author was member of the survey and exploratory party.

3. DETERRA, H. & PATERSON, T. ,1939—op. cit.

4. BLANFORD, W. T., 1869—"On the geology of the Taptee and Nerbudda and some adjoining districts." Mem. *Geol. Sur.* 6 (3).

5. The author submitted a paper—"Recent explorations in Hoshangabad"—to the Anthropology—Archaeology section of the I.S.C.A.,1958-59, which illustrates several of the 'Middle Stone Age' tools, and the microliths.

6. SANKALIA, H. D., 1956—op. cit.

lithic industries of Nevasa and precedes Series III which is Microlithic and follows Series I which is Lower Palaeolithic. The three gravel phases are distinct and separate as are the three series of industries. Climatically this area lies south of the dry north Gujarat climate. At present, it is difficult to interpret these gravel phases in relation to the Bombay sequence. Here, again, like Middle Narmada and Bombay, the industry within itself is quite unspecialized but quite distinct from the industries it precedes and follows. The fine material utilized is chert, jasper, chalcedony, agate, etc. Cores, flake-blades and scrapers are available " insitu " and in the washed out material in the river bed.

Professor Haimendroff's collection from Adilabad[1] also brings to light a similar industry which awaits publication.

Functionally, scrapers, points, borers, burins, 'hollow' scrapers etc., are required for scraping and cleaning skins, for working on bone or for trimming secondary branches of trees, shrubs and herbs (see Appendix). In Europe burins are commonly used in the Upper Palaeolithic and the Mesolithic for working on bone and antlers or wood and this function makes it a rather specialized tool. Therefore, it is easy to understand its absence in India due to environmental differences and, presumably, bone, antler and wood were not so extensively or finely worked as in Europe. Function, however, cannot be too rigidly attributed to a particular implement. But on the whole this industry gives the impression of having flourished in an environment of woods with medium vegetation of woodlands such as exists today in the Bombay area.

The gap in the North Gujarat sequence is explainable, by this study and observation of the climatic sequence in the different river valleys, and by signifying the woodland climate that is essential for this industry to flourish. To quote Zeuner[2] about the Red soil horizon in Gujarat which intervenes between the two aggradations and the climate generally in Gujarat—" The Red soil indicates a wetter condition than before or after it, but the humidity required could not be much higher

1. Referred to by Subbarao, B., 1956—op. cit.
2. Zeuner, F. E., 1953—op. cit.

...CE OF THE DIRECTOR OF ... OLOGY

than the present times. It is (the Red soil) not lateritic, the chalk is not washed properly and seen in the 'B' horizon and the feldspars are not undifferentiated. This type of Red soil, complete and lacking in chalk is found today underneath dry woodlands with 100 mm. rainfall with long dry periods." And he[1] adds from his observation of the Sabarmati, Mahi and the Orsang, "..in this area of Gujarat the aeolin sediments present are so much that the climate regarding the period of the fossil soil (Red horizon) must have been on the whole much drier." The climate of North Gujarat today is dry, and the vegetation does not favour the possibility of the existence of a 'flake-blade-scraper' industry. It favours more the Microlithic industries, the sites of which are numerous. The main reason for the gap is the dry climate. Thus far, inspite of intensive explorations this gap has not been filled up. For practical reasons the Red horizon cannot be explored since the cliffs are steep and inaccessible. The Bombay industries occur in a humid area.

In the Narmada and the Godavari valleys, which come under the humid climatic zone, these industries occur in the Basal Gravel and the Black Soil group. The Black Soil varies from region to region. The fertility of this soil depends on its inorganic components and also the organic constituents derived from the humus which implies vegetation and jungle growth. The humic content of the Black Soil varies from 1-10% and its black colour is due to the iron compounds in it. "Its origin is not certain but it is generally ascribed to long continuous surface action on rocks like Deccan trap and Peninsular gneisses of a basic composition. Further, a long cycle of secondary changes and impregnation by iron and decomposed organic matter resulting from ages of jungle growth over it would give it the regur character[2]". This suggests a humid climate for the Basal Gravel and the Black Soil group which is favourable for the functioning of this 'flake-blade-scraper' industry. It is not certain where the Bombay horizon of this industry fits in when compared to the Black Soil group. But it has only been stated, so far, that it is in a certain climate and in a particular stratigraphical context that this industry seems to occur.

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1. *Ibid.*
2. WADIA, D. N., 1953—op. cit., p. 409.

On the foregoing conclusion and generalizations, the gap of this industry in North Gujarat is explained. But where the climate is not dry, for instance, near Rajpipla, where the " brown earths intervene between the two fluviatile aggradations ",[1] (although the cliffs are inaccessible), or in Eastern India and other humid areas of India where the Palaeolithic and the Microlithic industries have been found, there is every reason that this industry should be discovered.

Furthermore, familiarity with this material including its European and African equivalents is essential when looking in fresh areas because it is important to know just what sort of industry one is looking for.

Until recently, not much attention has been focused on this industry which orients itself to the Indian environment because, frequently, parallels to the European and African sequences are sought for. But it is hoped that a new impetus is given in the light of the recent discoveries from the Godavari-Narmada valleys and the Bombay area for a thorough investigation of both old and newly discovered Stone Age sites.

The ' Late Stone Age ' or the Microlithic Industries :

Definite kind of evidence regarding the upper and lower limits comes for the Microlithic industries from the Satara area, notably from the sites of Wai, Mahuli, and Talechamet. These limits can be further corroborated from other sites, in India, with stratigraphical evidence. In Bombay—at Chembur, microliths were found six inches below the surface along with red washed pottery. This association cannot be conclusive since it is not stratigraphical, but it would not seem far-fetched in the light of the evidence from Talechamet.

At Mahuli—where the fine gravel phase begins—utilized blades and a steeply worked flake-blade was found ' insitu '. (Six specimens about half an inch in size were found). This deposit was overlain by ten feet of silt. No geometric microliths were found.

1. Zeuner, F. E., 1953—op. cit.

At Wai, in the section of the tributary nala which joins the Krishna river, in the gravel deposit (which is overlain by silt) a Microlithic core was found.

Surface explorations from Talaechamet yielded a well worked beer-bottle glass core. It is of a dark green colour very similar to obsidian. Fortunately, the base of the bottle which is artificially moulded can be seen clearly. Such bottles were first manufactured—at the earliest—about the 17th-18th Century A.D. This evidence clearly points out, therefore, to the late survival of the Microlithic industry. The villagers and the local people, in Mahableshwar, confirm this by recalling that these microlithic sites were at one time the camping sites of tribal people. The industry is geometric in character—the statistical account is not made but this element is present. These sites are situated away from the main routes of trans-continental communications and highways and are isolated. These are the areas where people of a lower culture seek refuge because of the impact of contact with people of a higher culture. The wood-land jungles, even today, are excellent for a hunting community even if 'jhumming' be practised.

Thus, the first two sites of Wai and Mahuli provide the lower limit for the Microlithic industries and the third site in Mahableshwar provides us with a new upper limit for the Microlithic industries which can easily be expressed in terms of absolute age. The evidence for the lower limit also comes from other areas in India, notably :—

(i) **In Central and Northern Gujarat ;** Late Stone Age man settled on the sand dunes—overlooking the ponds—belonging to the last wet phase, for example, at Langhnaj.[1] The Microlithic industry belongs to the period of the older land surface and is not associated with any heavier tools but with a coarse hand made and ill fired pottery. No chronological conclusions can be made except that this industry belongs to the buried soil wet phase.

(ii) **At Baroda**[2] there was a clean barren layer between the Microlithic industry and the Early historic period.

1. SANKALIA, H. D., 1946—op. cit.

2. SUBBARAO, B., 1953—*Baroda through the ages.* M. S. University Archaeological Series No. 1, Baroda.

(iii) **At Timbarwa**[1] the evidence for the Microlithic industry is pre-400 B.C. because, it lies under the N.B.P. phase which in turn is overlain by the Early historic phase of Baroda.

(iv) **In the Singarauli basin**[2] a Microlithic industry was found four feet below the upper alluvium on the southern bank of the 'Balia nadi'. This site links with the neighbouring microlithic sites of Banda, Bundelkhand and Baghalkhand.

(v) **At Sangankallu**[3] the earliest phase is a crude Microlithic industry of quartz associated with a few heavily patinated flakes of trap and sandstone showing the prepared platform technique. The next, Polished stone celt phase is followed with a gap in the habitation.

(vi) **At Birbhanpur**[4] near Durgapur in the Damodar valley, West Bengal, is found a pre-pottery Microlithic industry on the Penultimate Tn-1 terrace of the Damodar river. The industry is sealed by a three foot thick deposit of sandy earth which is weathered. Blades, lunates, points, borers, burins and scrapers, are found but no triangles or trapezes. Therefore, the absence of the geometric element plus the evidence of the weathered sandy earth gives this industry a high antiquity.

(vii) **In the Tinnevalley district**[5] of Madras State, microlithic sites are of high geological antiquity since they are associated with fossil and Recent red-dune sands called 'teris'. The sites are important because of the topography, strati-

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1. MEHTA, R. N., 1955—*Excavations at Timbarwa.* M. S. University Archaeological Series No. 2, Baroda.

2. KRISHNASWAMI, V. D. and SOUNDARAJAN, K. V., 1951—"The Lithic tool industries of the Singrauli basin." *Ancient India, No. 7.*

3. SUBBARAO, B., 1948—op. cit.

4. LAL, B. B., 1958—"Birbhanpur, a Microlithic site in the Damodar valley, West Bengal." *Ancient India*, No. 14.

5. ZEUNER, F. E. and ALLCHIN, B., 1956—"The microlithic industries of the Tinnevalley district, Madras State." *Ancient India*, No. 12.

graphy and typology. These areas have often formed refuge areas for the primitive tribes. Sites such as Kuttampuli and Sawyerpuram yield implements heavily stained with red hydrated ferric oxide which implies that they came from the weathered sand of the regional soil section. These sites are associated with a sea level phase somewhat higher than at present (20′-30′) which, most likely correlates with the post-glacial climatic optimum of Europe. This phase has been tentatively dated as c. 4000 B.C. The microlithic site Megnanpuram, south of the Tambraparni river, lacks geometric forms and is possibly associated with an older land surface. Therefore, it is of greater antiquity than the Sawyerpuram group.

Common to all these Tinnevalley sites are discoids and chopping tools along with backed-blades, hammer stone, blades, lunates, transverse arrow-heads, asymmetrical points and very rarely a micro-burin. But the most important type is the bi-facial point with pressure flaking which is common to the Microlithic industries of Africa, Ceylon and Australia but not to the rest of the Indian Microlithic industries. Quartz and chert is mainly used in the ‘ teris ’ sites.

To sum up, we find a typological development of the ‘ Middle Stone Age ’ industries into the Non-geometric Microlithic industries with the changing conditions of climate and to a lesser extent, perhaps, of certain types of the ‘ Early Stone Ages ’ into the ‘ Middle Stone Age ’ industries. These explorations also give us a new limit of the Microlithic industries in India in providing evidence for a late survival of these ‘ Late Stone Age ’ cultures, in time. It also suggests that the Non-geometric seem to have specialized—in the isolated areas—into the Geometric Microlithic industries. The Geometric industries in the isolated areas continued to survive—in a more or less pure form without fully mixing or taking over the new material traits from the higher cultures of the neighbouring regions—in the midst of historical times as late as the 17th-18th cent. A.D. At other places the Microlithic industries have mingled with the higher cultures or, at times borrowed elements such as pottery making, etc. : or the technique of blade-production of the Microlithic industries has been borrowed by the Chalcolithic cultures, modified and developed into a specialized technique. These cultures were as-

similated by the process of acculturation or cultural-contact. The Microlithic cultures that survived late into the historical period also disappeared with the trans-continental diffusion of traits and ideas—which spread because of the increasing tempo, and easier means of communication—into these remoter and isolated areas.

This tentative conclusion—these interesting possibilities—can, of course, be proved only by excavation, *i.e.*, in a stratigraphical context and by further intensive work in other parts of India.

APPENDIX

A note on the function of the Stone Tools—specially the Microliths

At prehistoric sites one mostly finds stone tips of weapons and tools and it is easy to forget that most of these were probably hafted, gummed into bone or wooden shafts or handles, bound on to them with sinews. This becomes apparent, however, by studying the material remains of extinct societies at archaeological sites and of the recently extinct or living stone age—'primitive'—societies. Theories regarding the manufacture of stone tools and the actual use they were put to are mainly and necessarily conjectural at the prehistoric sites whether in India, Europe or elsewhere. Combined with the rare archaeological evidence, the examples from the New World as well as the Australian and African tribes, clearly illustrate the fact that the stone tools—specially the microliths—were rarely used as such, but mostly hafted singularly or as part of a composite tool. The chances of survival of the hafts or handles is remote at any prehistoric site specially in India where the temparate climate of Europe or the dessication of the West Asian desert is absent.

The importance of the study of stone age tools of the aborigine is self-evident because it gives a basis to the conjectural idea regarding the technique of manufacture and actual use the tools were put to, and is quite like the study of prehistoric stone age assemblages which involve a study of the whole range of artefacts.

James Scott (as quoted by Brough Smith in 1878)[1] recorded that the Tasmanians used sharp edges of stones for making notches, for climbing and cutting trees, for spears and roughing their handles. Brough Smith also records James Rolings[2] that Tasmanians used stone knives for skinning kangaroos, to cut up the carcass. First hand information is recorded by Tindale[3] (1935) of the use of large chopping

1. MITCHEL, S. R., 1949—*Stone Age Craftsmen*, Melbourne, p. 8.
2. Ibid. p. 11.
3. Ibid. p. 11.

implements for the felling of trees, opening up trees or cutting underground roots. Mountford (1941)[1] describes the making of a wooden spear thrower by the Pitjendandjari tribe of South Australia. "The handle is set in gum and the adze of stone set in....".

Stone tools were put to use in various ways by the aborigine like making wooden weapons and utensils which rarely survive in archaeological records. Women of a Central Australian tribe, as described by Love (1942),[2] made wooden dishes by stone implements. The other weapons made included a wide range of types from hunting, fighting to fishing spears often barbed. These weapons include spear throwers of a variety of forms, throwing sticks, fighting clubs and boomerangs. The utensils were for food and water holding purposes. The preliminary work of making these wooden objects was the shaping and cutting done by choppers, pebbles or hafted ground axes. Secondary work was done by scraping and planing, cutting or carving with sharp edged flakes to remove the irregularities. Still smaller tools served in the final stages. The small tools were surmounted by lashing them to the handle or stick and fixing with vegetable resin or cement. Sharp edged flakes with secondary retouch " were used for skinning animals, extracting sinews and cutting up large animals after they were cooked in the native oven. "[3] The nomadic aborigine carried his smaller stones in string bag containers or stored larger stones by burying them in the sands of his more frequented sites.

The Australian aborigine made the tools at the moment of requirement adapted to the material at hand—" ..when an end scraper was the required tool for the work in hand he made that : next, if this flake was suitable it may have also served as a side scraper, and therefore, One-side-one-End scraper (Side-End scraper)....".[4] " One has only to watch the aborigine pick a piece of suitable stone and with a

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1. Ibid. p. 11.
2. Ibid. p. 13.
3. Ibid. p. 15.
4. Ibid. p. 25.

hammerstone strike off a number of flakes, test each for keeness and when satisfied, use it for a purpose intended : when that is completed he discards it....".[1]

Sharp edged flakes were used by the aborigine of Western, South and North Australia as barbs for the death spears or by the Western Australian native as multiple flake knives or saw, formed by setting series of sharp edged flakes in a grooved stick and cemented with resin. The natives of the far North and North-West of Australia use the bi-facial points—similar to the ones found in the Tinnevalley and African Microlithic industries—for short spears and also for cutting meat, sinew, and skin because the edge is sharp enough for such a purpose. The use of vegetable cement or resin by the Australian aborigine for hafting the microliths into a cleft at the end of a short stick or stone is widespread. This handle also served to protect the hand besides its functional value.

Studying the various aborigine sites it becomes quite evident that a large part of the stone collection of the tribesman consisted of flakes, chips and blades which were simply used and discarded. This would generally be true of a large part of the stone age assemblage at any prehistoric site.

The Bushmen in ancient times used a resin—from the roots of Pterocelastrus variabilis—which is very brittle and had to be mixed with other cementing substances.[2] They mounted knife-blades in a mass of hard gum as in Australia or the Admirality islands, or inserted it into a handle of bone or wood and then glued, as done by the Eskimo women. Side and End scrapers were also hafted in a similar way. Similar to the Australian natives, the Bushmen used lunates as arrow barbs set in grooves in a wooden shaft which were made by hollowing out the wood with burins and were probably poisoned. John Smith[3] writing of the Indians of Virginia, 1606, supports these accounts of the hafting of stone tools. He says that they made arrow-heads very rapidly—with a little bone—from any splint of stone and glass.

1. Ibid. p. 30.

2. Cole, S., 1954—*Prehistory of East Africa,* Penguin books. p. 151.

3. Ibid. p. 151.

Glue can be obtained from boiling horns, natural pitch or resin found in many plants and trees. The sinews are made of raw hide thongs twisted around the shaft which shrinks considerably on drying, binding the parts together very securely.[1]

Thus, we find that arrow-heads, spears, and daggers and even scrapers, knife-blades and gravers were hafted into handles, held in place by natural gums or resins and at times bound as well to give additional security.

Turning to examples from archaeological sites, one comes from a recent site in the New World, in Nevada, U.S.A. This supports the reconstruction and the uses of stone tools. " ..Hafted stone knives were found in Cache 10, of chipped flint." The wooden handle is circular and tapers towards the end and is made of soft wood probably of willow. " A cleft, 17 mm.. long fits over the base of the blade which is firmly attached with pitch. On the handle, below the blade, is a seizing of twisted sinew to keep the wood from splitting ".[2]

Leaky's[3] excavations at Gambles Cave, East Africa and on another occasion on a hill south-west of Kikiyu station, revealed in the upper occupation level lunates lying in such a position that there was no doubt they had been hafted as arrow barbs. In North Africa, lunates have occasionally been found inserted into bone shafts at Capsian sites.

In Europe, discoveries from the Maglemosian station (Mesolithic) of Holmegaard in Zealand, Scandinavia, illustrates clearly the functional aspect of the microliths.[4] Here, for instance, the slots near the tips of some of the pointed wooden arrow shafts, along with the bow, were found. These shafts held inserted microliths which were also used to barb the shaft. From the vertebra of a young man buried in the Tardenoisian midden on the isle of Tevec, off the peninsula of Quiberon in Morbihan, France, was found embedded for the third of its length,—

1. Ibid. p. 151.

2. HEIZER, R. F. and KREIGER, A. D., 1956—"The Archaeology of Humboldt caves", *University of Calfornia Press*. p. 30.

3. COLE, S., op. cit. p. 187.

4. CLARKE, J. G. D., 1952—*Prehistoric Europe*. p. 35-36.

a triangle. This microlith must have required sufficient force to be inserted so deeply and, thus, would mean the use of a bow and arrow.[1] Two microliths and a flint flake were also found in the body of another skeleton from Jyderup, in North-west Zealand.[2] Further examples from the European Mesolithic, where the microlith was hafted into bone shafts in the sides come from the site of Skane, Sweden[3] or at Stellmoor, in Germany where lunates have actually been found in position as barbs in bone points.

Examples of 'petit-tranchet' still affixed to the wooden shaft come from Denmark and Germany. But the most clearly defined evidence comes from Egypt for the utilization of these transverse arrow-heads. On the rock engravings of Southern-Upper-Egypt an archer is shooting a running ostrich with undoubted chisel-ended arrows.[4] Chisel-ended arrows are also depicted in the scene of a lion hunt on a stele from Erech in Sumer.[5] In the Iberian peninsula and North Africa are found tanged and barbed Microlithic points suited for arrow-heads. In the cave art of Eastern Spain, for example, in Cuevade-lor-caballos, Castellon,—some of which is Upper Palaeolithic but mostly of later times—the bow is represented in a painting showing archers hunting stags.[6]

Evidence from Sialk in Iran and from the Natufians in Palestine (6000 B.C.), comes of sickles with flint teeth similar to the Badarians of Egypt (4000 B.C.). From Sialk again and at Anau are the famous examples of sickles with animal (camel) heads—the same as from Palestine.[7] In the Egyptian Neolithic again, from Merimde and Fayum (c. 4000 B.C.) similar examples of sickles are noticed.[8]

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1. Ibid.
2. Ibid.
3. *The History of Technology*, Vol. 1., 1955 (Oxford, Clarendon Press). p. 497.
4. CLARKE, J. D. G., 1952—op. cit.
5. *History of Technology*, 1955—op. cit. p. 496.
6. Ibid. p. 461.
7. Ibid. p. 461.
8. Ibid. p. 514.

Finally, from Neolithic Switzerland comes the evidence of birch pitch having been used for mounting microliths on wooden shafts[1]; and of crescentic flint sickle blades from Chalcolithic Denmark (2000 B.C.).[2]

1. CLARKE, J. D. G., 1952—op. cit. p. 53.
2. *History of Technology*, 1955—op. cit. p. 503.

KEY TO ILLUSTRATIONS

Fig. VI, VII and VIII.

1, 2 & 11.	Side-Scrapers.
3 & 4.	Scraper-cum-borer.
5.	Nose-Scraper.
6.	Steep-End-Scraper.
7.	End-Scraper (cum-point ?)
8, 21 & 23.	Side-Scraper on flat flake.
9.	Point-broken.
10.	' Hollow ' Scraper.
12.	Triangular End-Scraper.
13-15, 18, 20, 22 & 24.	Flakes.
16.	Point on heart-shaped flake.
17.	Borer.
19.	Scraper with facetted-platform ' *in situ* '.
25.	Chopper (?)
26.	Core.

Fig. IX, X, XI and XII.

1.	Retouched semi-circular point.
2.	Double Side-Scraper.
3.	Scraper-cum-borer.
4, 6, 8, & 23-25.	' Hollow ' Scraper-cum-points.
5.	' Hollow ' Scraper.
7.	Double Steep-End, notched Scraper.
9.	Side-End Scraper.
10-12, 18-22, 27 & 28.	Side-Scrapers.
13 & 14.	Notched flakes.

15 & 17.	Retouched points.
16.	Circular Scraper.
26.	Heart-shaped Scraper.
29.	Microlithic Single-platform core (Nmbsn).
30 & 37.	Steep Side-End Scraper.
31.	Microlithic core-remain.
32 & 33.	Steep Side-Scrapers.
34 & 36.	Steep End-Scrapers.
35 & 38.	End-Scrapers.

Fig. XIII.

1-3, 24 & 28.	Backed-blades.
4.	Backed-blade-cum-point.
5.	Shouldered point.
6 & 7.	Notched flake-blades.
8.	Backed-flake.
9.	Retouched, notched-flake.
10.	Double-notched point.
11 & 34.	Notched and utilized blades.
12, 18, 37 & 40.	Double ' Hollow ' Scraper-cum-point. (40, with ' facetted ' platform).
13, 16, 20 & 29.	Side-Scrapers.
14.	Utilized-blade.
15.	Retouched ' thick ' flake.
17.	Circular Scraper.
19.	Notched semi-circular Scraper.
21-23.	Core-remains.
25.	Blade with concave side retouched.
26.	Lunate or Triangle (?).
27, 30 & 33.	Points.
31.	Awl.

32.	Concave-Side and End-Scraper.
35.	Transverse Arrow-head.
36.	Double 'Hollow' Scraper.
38 & 39.	Utilized Core-remains.

Fig. XIV.

1.	Blade with notch at base.
2.	Lunate or Triangle (?)
3.	Triangle.
4.	Retouched Point.
5.	Blade.
6 & 7.	Blade with notch in the middle.
8.	Double-notched flake-blade.
9.	Backed blade.
10.	Steep End-Scraper.
11.	Concave-sided point.
12.	Keeled Side-End Scraper.
13, 17-20.	Single-platform core.
14, 15 & 21.	Double-platform core.
16.	Utilized, green jasper, flake.
22.	Core with more than two platforms.
23.	Steep-Side and notched Scraper.
24.	Disc-Core Scraper.
25.	Core-Side Scraper.

Fig. XV and XVI.

1.	Steep Side-End Scraper.
2 & 4.	Side-Scrapers.
3.	Borer.
5.	Concave Side Scraper.
6, 12-14, & 19-23.	Utilized flakes.
7.	Steep side Scraper.

8.	Lunate.
9.	Single-platform core.
10 & 11.	Core-Scrapers.
16.	Scraper (cum-point ?).
17 & 18.	Steep scrapers.

Fig. XVII, XVIII and XIX.

1-4, 9, 11, 14 & 17.	Utilized blades—snapped.
5 & 8.	Points on triangular flakes.
6 & 35.	Steep Side-Scraper.
7.	Backed-blade-broken.
10.	Retouched (Point ?) Scraper.
12 & 13.	Serrated edge flakes.
15, 18, 25 & 33.	Steep End-Scraper.
16 & 21.	'D'-shaped 'flat' Scrapers.
19 & 20.	Side-Scrapers.
22, 24 & 28.	Scrapers with prepared-platform.
23.	Borer with prepared-platform.
26, 27 & 31.	Side-End Scrapers.
29.	Scraper steeply worked on all sides.
30 & 32.	Cores.
34, 36, 38, 39 & 41.	Core-Scrapers.
37 & 40.	End-Scrapers.
42.	Double-notched Scraper retouched and utilized.
43 & 44.	Single-notch Scrapers.
45.	Steep Double-End Scraper.

Fig. XX, XXI and XXII.

1, 7 & 16.	Utilized blades.
2 & 3.	Utilized flake-blades.
4.	Spall.

5.	'Thick' blunted-back blade.
6 & 10.	Retouched points.
8, 35 & 37.	End-Scrapers.
9.	Notched Scraper.
11.	'Larger' thick backed-blade.
12.	Borer
13, 32 & 33.	Side-End Scrapers.
14.	Circular Scraper.
15.	Double-Side 'Keeled' Scraper.
17 & 23.	Prepared-platform Side-Scrapers.
18, 26 & 31.	Points.
19 & 20.	Steep End-Scrapers.
21, 22 & 36.	Side-Scrapers.
24, 27 & 28.	Heart-shaped Scrapers (Points ?).
25 & 34.	End-Scrapers (cum-burin ?).
29.	Triangular Double Side-Scraper.
30.	Concave Side-Scraper.
38-45.	Single-platform cores (38 '*in situ*')
46-48.	Double-platform cores.
49, 50 & 53-57.	Core-remain Scrapers.
51.	Core with more than two platforms.
52.	Burin (?).

Fig. XXIII.

1.	Blade retouched on concave side.
2-6.	Backed blades.
7.	Backed blade with 'S' twist.
8.	Spall.
9 & 10.	Notched flake-blade.
11.	Point with working at base.
12.	Scraper-cum-point.

13, 14 & 20.	Points.
15 & 37.	End-Scrapers.
16, 18, 19, 28 & 29.	Side-Scrapers.
17.	Concave-Side-Scraper.
21.	Triangular Side-Scraper.
22, 23, 25, 39 & 42.	Core-remains.
24, 27 & 45.	Core-Scrapers.
26.	Bec-de-flute burin.
30.	Blade.
31, 32 & 34-36.	Broken backed-blades.
33 & 38.	Steeply retouched points.
40 & 46.	Lunates.
41.	'Larger' Lunate.
43 & 44.	'Larger' backed blades.
47.	Used blade.

Fig. XXIV.

1.	Backed-blade-cum-point.
2, 3, 7 & 32.	Retouched points.
4, 9 & 17.	Utilized blades.
5, 14 & 16.	Notched flake-blades.
6.	'Thin' backed-blade.
8 & 26.	End-Scraper.
10.	Concave Side-Scraper.
11-13.	'Larger' backed-blades.
15 & 18.	Notched End-Scrapers.
19 & 22.	Points.
20, 24 & 39.	Triangular and heart-shaped Scraper.
21.	Concave Side-Scraper-cum-point.
23, 36 & 40.	Side-Scrapers.
25.	Side-End Scraper.
27.	Steeply worked round Scraper.

28 & 38.	Double-Side-Scraper with notch.
29.	Borer.
30.	Steep Double Side-Scraper.
31.	Double-End and Side-Scraper.
34 & 48.	Steep End-Scraper.
35.	' Keeled ' Steep End-Scraper.
37.	Scraper worked all around.
41 & 42.	Single-platform cores.
43, 47 & 49.	Core-Scrapers.
44 & 46.	Double-platform cores.

Fig. XXV.

1.	Backed point.
2.	Triangle.
3.	Lunate.
4.	Blade.
5, 6 & 12.	Broken blades.
7.	Backed-blades with ' S ' twist.
8.	Broken point.
9, 10 & 11.	Flake-blades.
13 & 18.	Scraper-cum-points.
14.	Serrated-edge Scraper.
15.	Elaborately retouched Scraper.
16.	Spall made into a point (?).
17.	Backed-blade.
19 & 22-26.	Cores.
20.	Steep End-Scraper.
21.	Core-Scraper.
27.	BOTTLE GLASS CORE. A. Ventral view. B. Dorsal view.

Fig. XXVI and XXVII.

1.	Micro-burin.
2 & 3.	Backed-blades cum-points.
4 & 5.	Lunates.
6, 7 & 26-28.	' Larger ' Backed-blades.
8 & 59.	' Thin ' Backed-blades, snapped.
9 & 10.	' Thick ' Backed-blades, snapped.
11, 56 & 58.	End Scrapers.
12.	Blades retouched on both edges to form point ?
13.	Steeply backed-blade.
14.	Triangle (?).
15-25.	Slightly retouched and utilized blades.
29.	Spall.
30.	Utilized Spall (?).
31 & 32.	Flake notched at base.
33, 34 & 37.	Flake notched in the middle.
35 & 36.	' Thick ' flake notched near the apex.
38.	Steep Side Scraper (broken point ?).
39 & 40.	Triangular Scrapers.
41.	Thumb-nail Scraper.
42-48.	Points—various kind.
49-53.	Steep End Scrapers.
54.	' Hollow ' spoke-shave End Scraper.
56 & 58.	Steep Side-End Scraper.
57.	Circular Scraper.
60.	Scraper on irregular flake.
61.	Side Scraper on squarish flake.
62.	Double-Side Scraper.

Fig. XXVIII.

1 & 2.	Double Concave-sided Scrapers.
3.	Scraper-cum-point.
4 & 11-13.	Utilized flakes.
5.	End-Scraper with prepared platform.
6 & 7.	Side-Scrapers on flat flake.
8.	Point.
9.	Steep End-Scraper.
10.	Side-Scraper.

Fig. XXIX.

50 & 52.	Prepared platform Scrapers.
51.	Utilized flake.
53.	Circular Scraper with prepared platform.
54 & 56.	Disc-Scrapers.
55.	Double-notched well worked Scraper.

Fig. VI. Tools from Nala Sopara

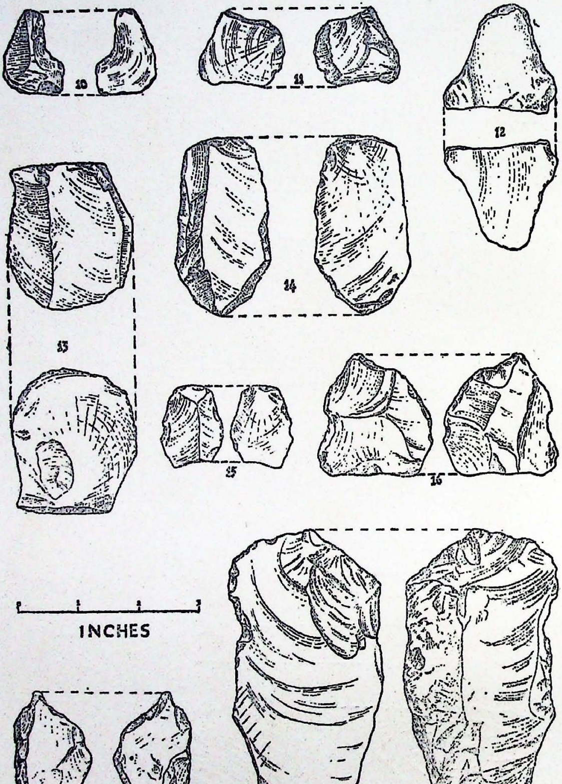

Fig. VII. Tools from Nala Sopara, Goregaon and Khandivli.

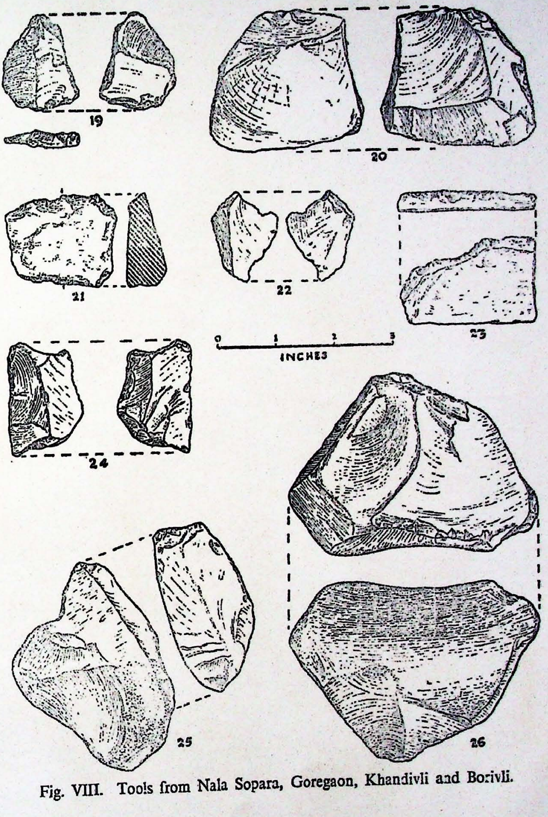

Fig. VIII. Tools from Nala Sopara, Goregaon, Khandivli and Borivli.

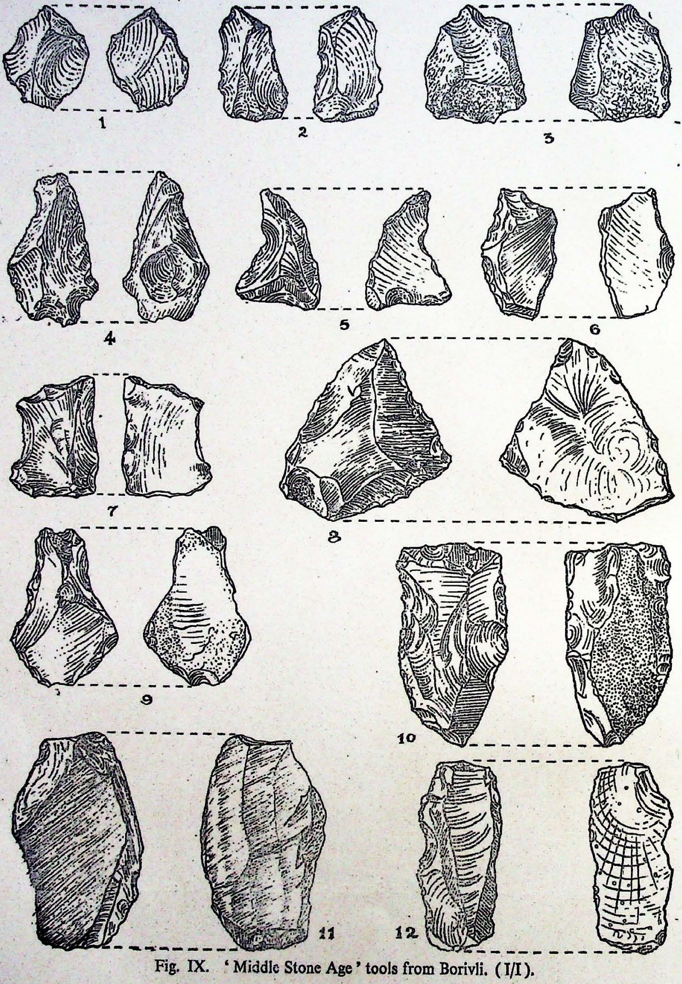

Fig. IX. 'Middle Stone Age' tools from Borivli. (I/I).

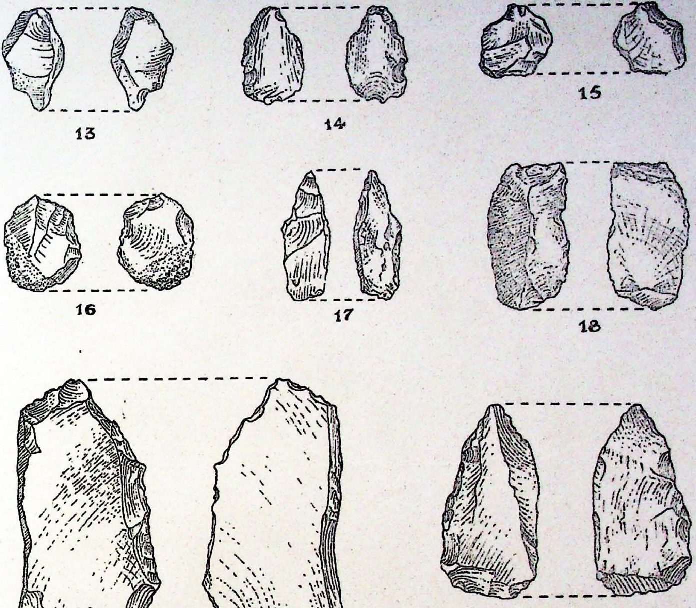

Fig. X. ' Middle Stone Age ' tools from Borivli. (l/l).

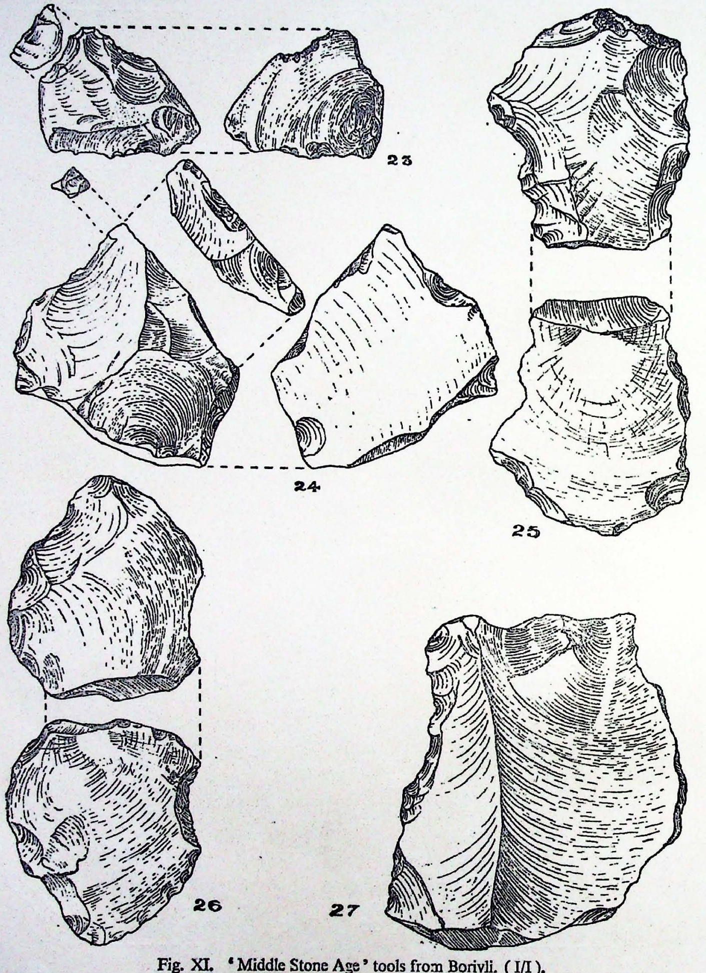

Fig. XI. 'Middle Stone Age' tools from Borivli. (I/I).

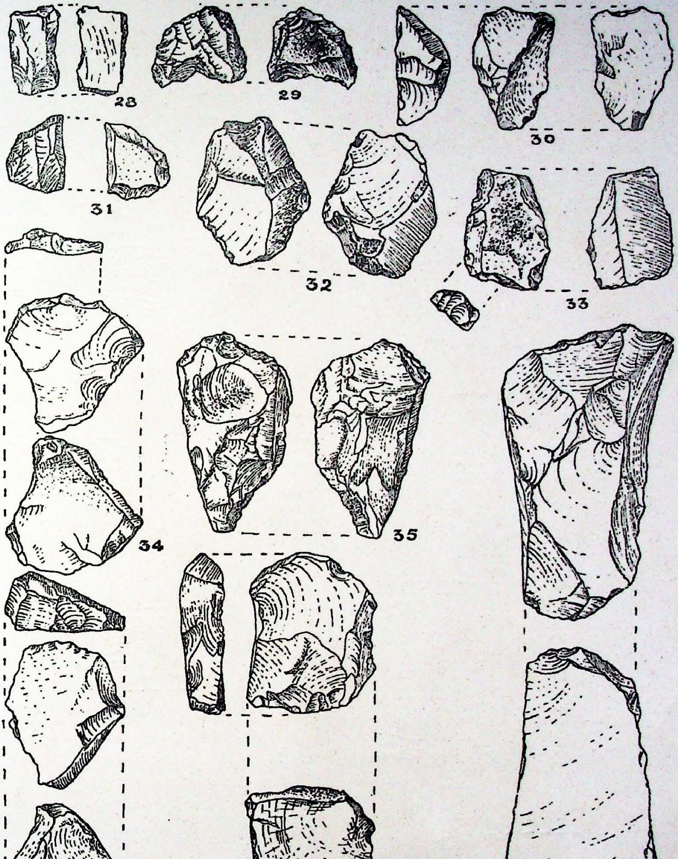

Fig. XII. 'Middle Stone Age' too's from Borivli. (1/1).

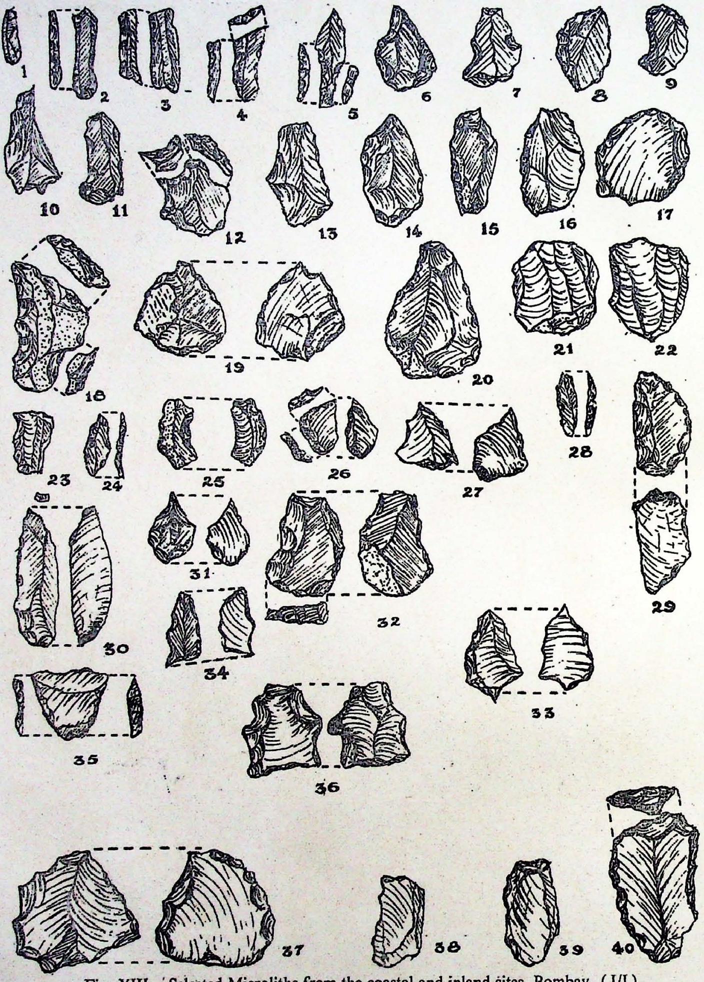

Fig. XIII. Selected Microliths from the coastal and inland sites, Bombay. (I/I).

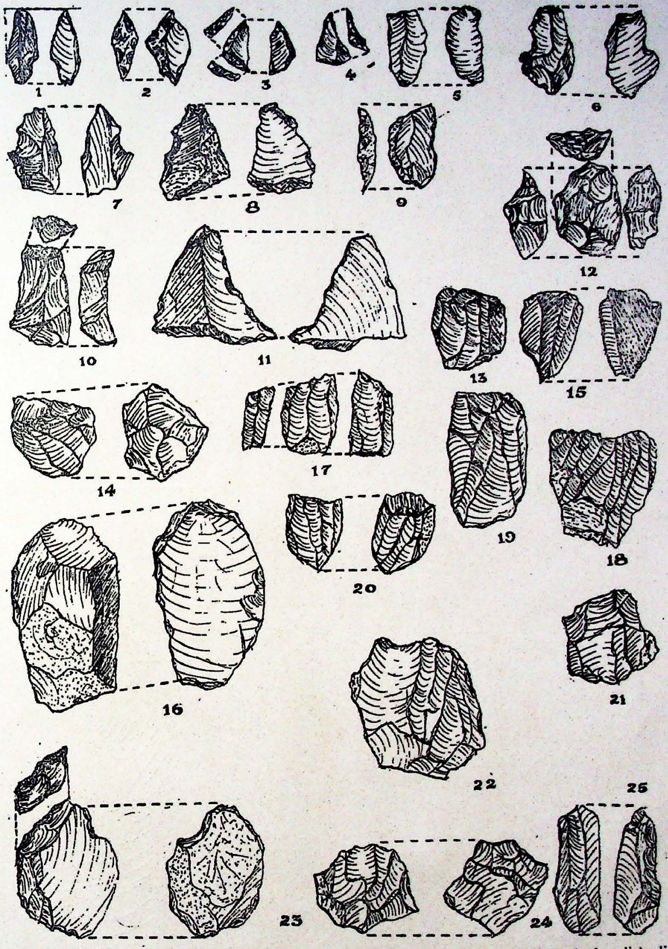

Fig. XIV. Microliths from Chembur, Bombay, and Cores and Core-tools from Ambenali-Jaoli, Satara. Chembur, 1-16 : Ambenali-Jaoli, 17-25. (1/1).

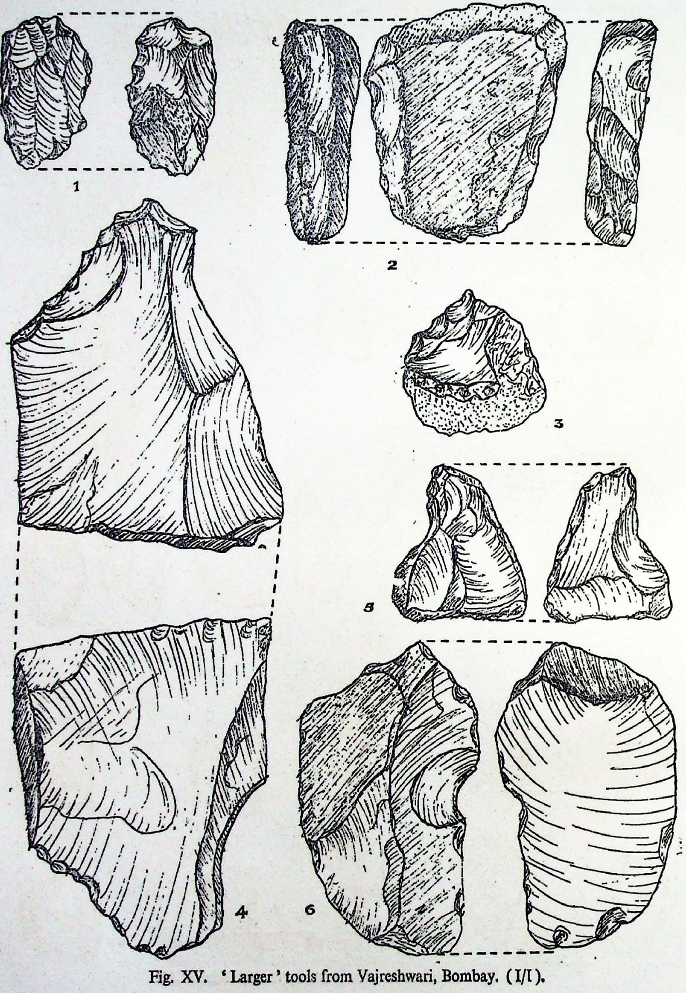

Fig. XV. 'Larger' tools from Vajreshwari, Bombay. (I/I).

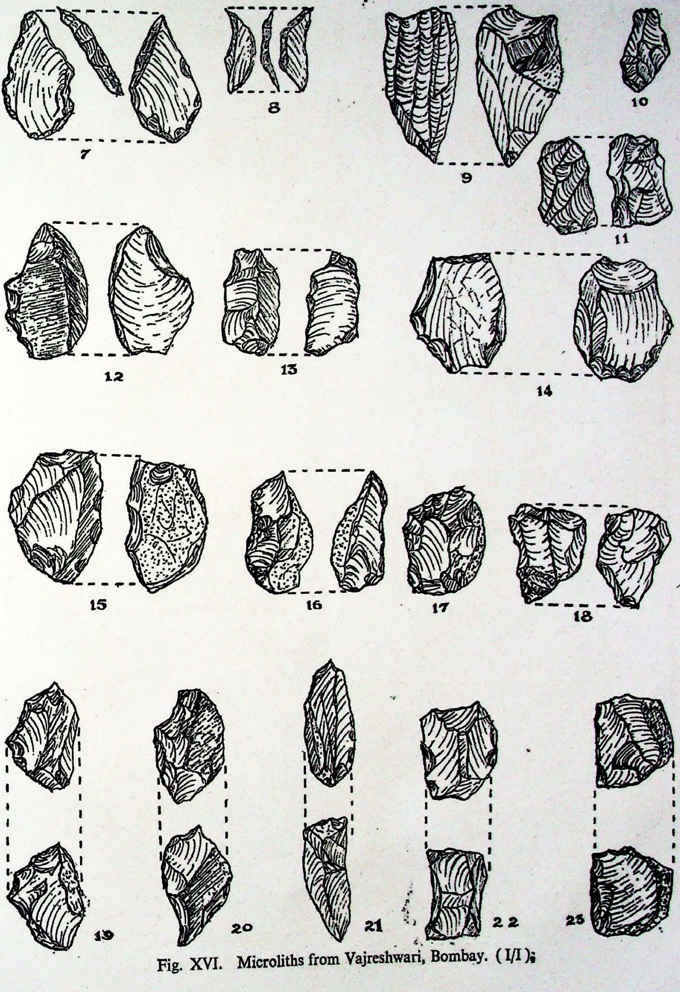

Fig. XVI. Microliths from Vajreshwari, Bombay. (I/I).

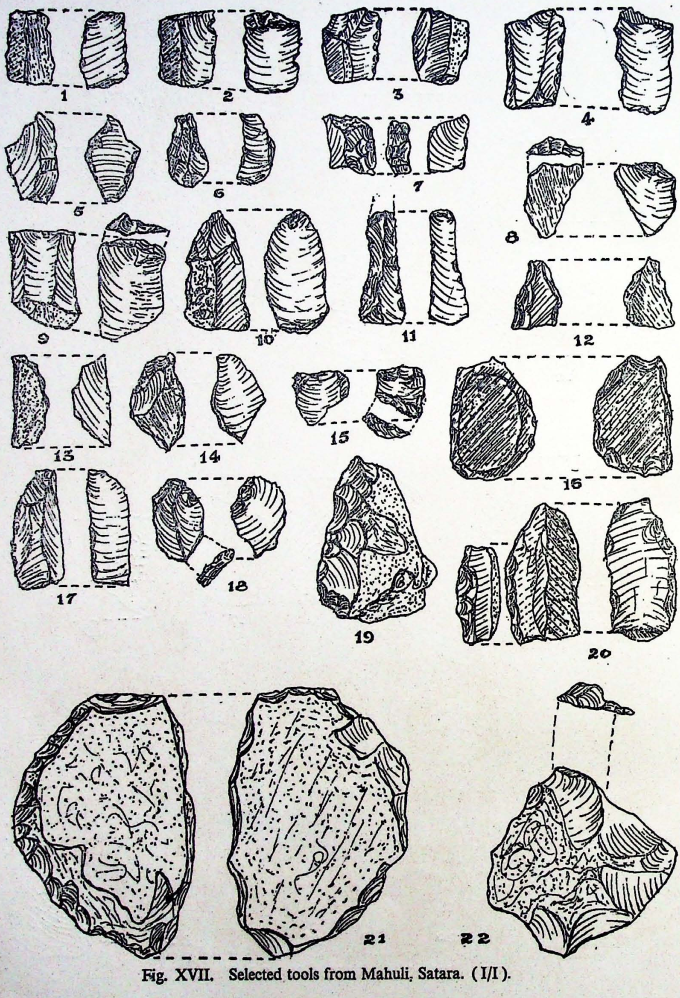

Fig. XVII. Selected tools from Mahuli, Satara. (I/I).

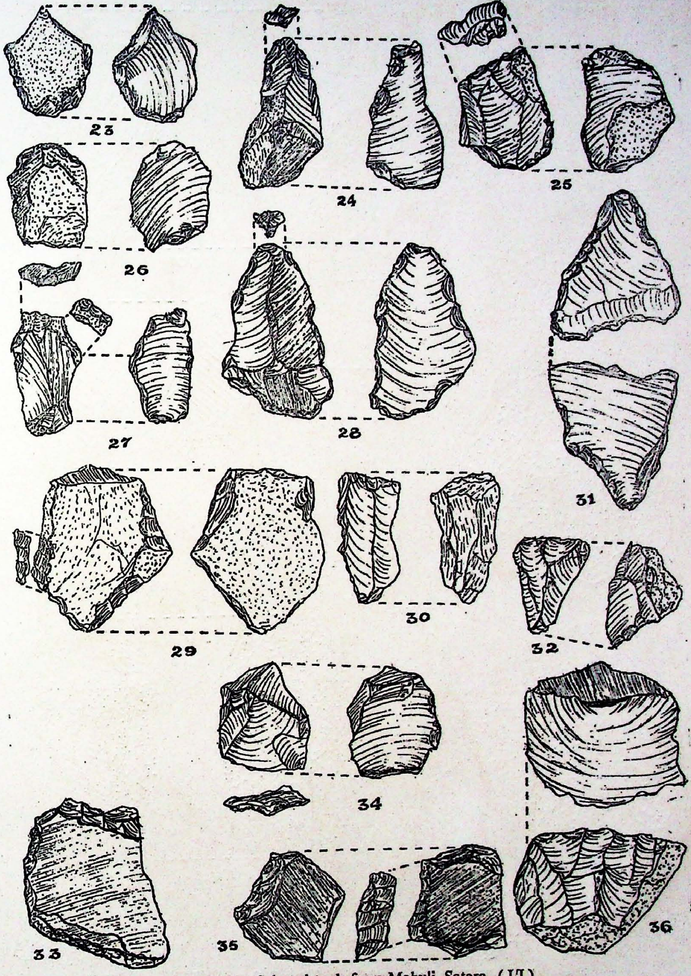

Fig. XVIII. Selected tools from Mahuli, Satara. (I/I).

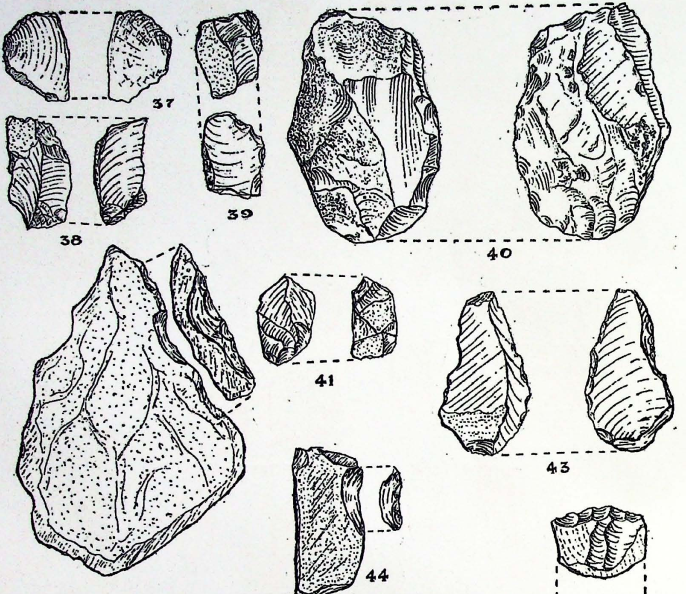

Fig. XIX. Selected tools from Mahuli, Satara. (I/I).

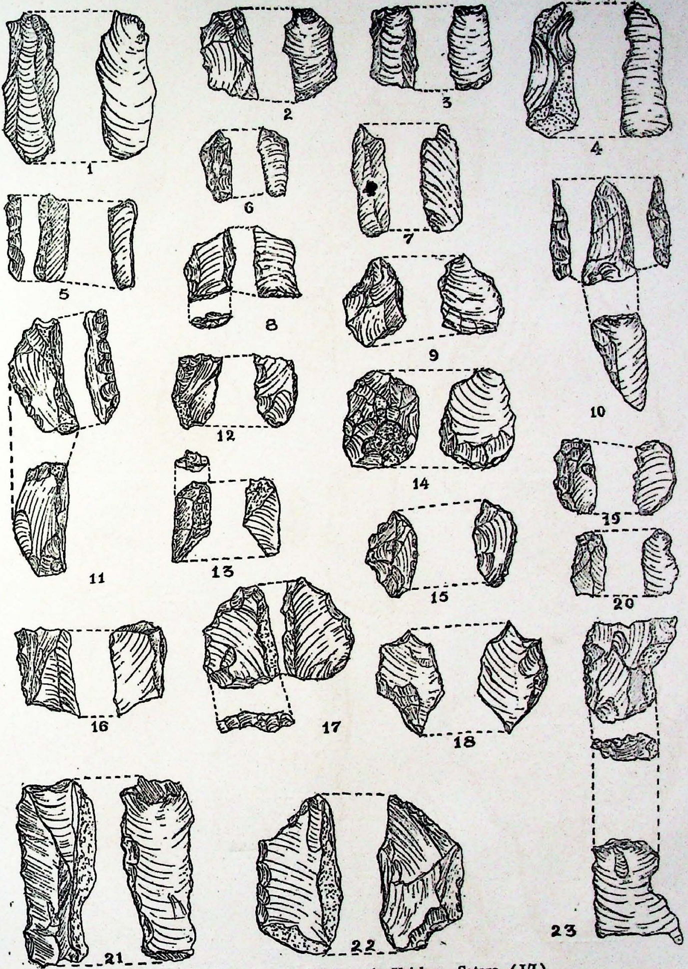

Fig. XX. Tools from Wai, on the Krishna, Satara. (I/I).

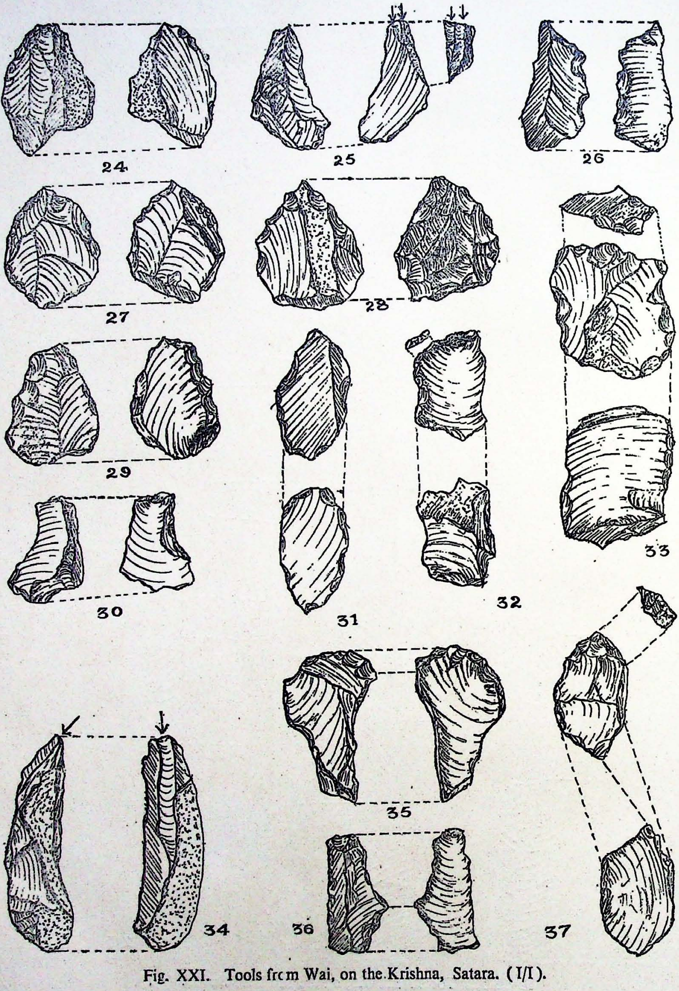

Fig. XXI. Tools frcm Wai, on the Krishna, Satara. (I/I).

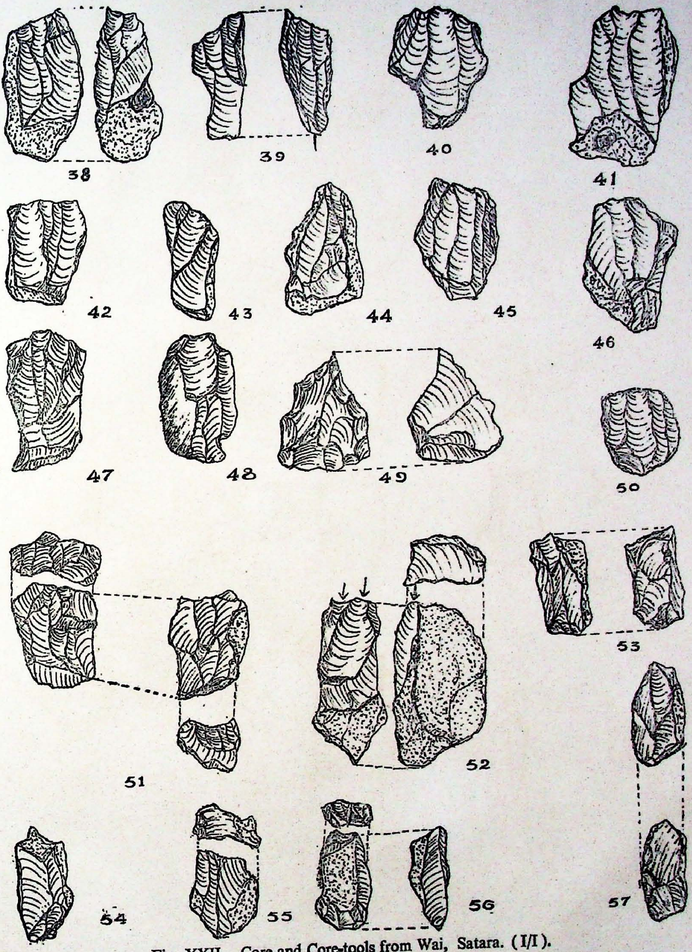

Fig. XXII. Core and Core-tools from Wai, Satara. (I/I).

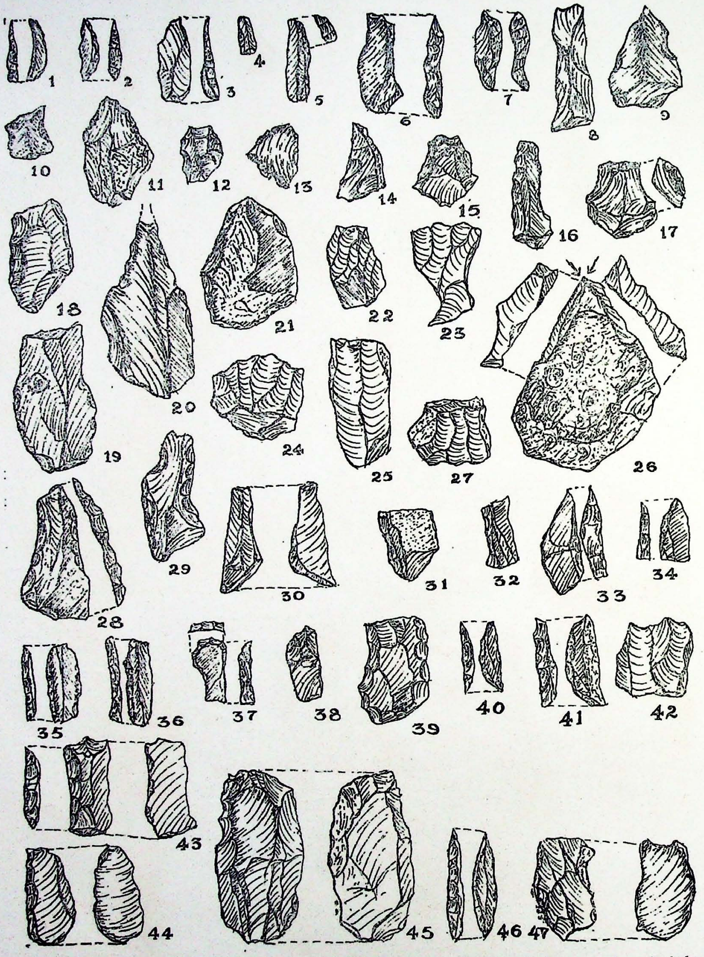

Fig. XXIII. Selected Microliths from the Mahableshwar area, Panchgani plateau and rock-shelter, I-27 : from Poona, 28 and 29 : Pratapgarh area, 30-33 : Helen's point, 34-39 : Panchgani road, 40-43 : Golf course area, 44 and 45 : Baghdad point, 46 and 47 (I/I).

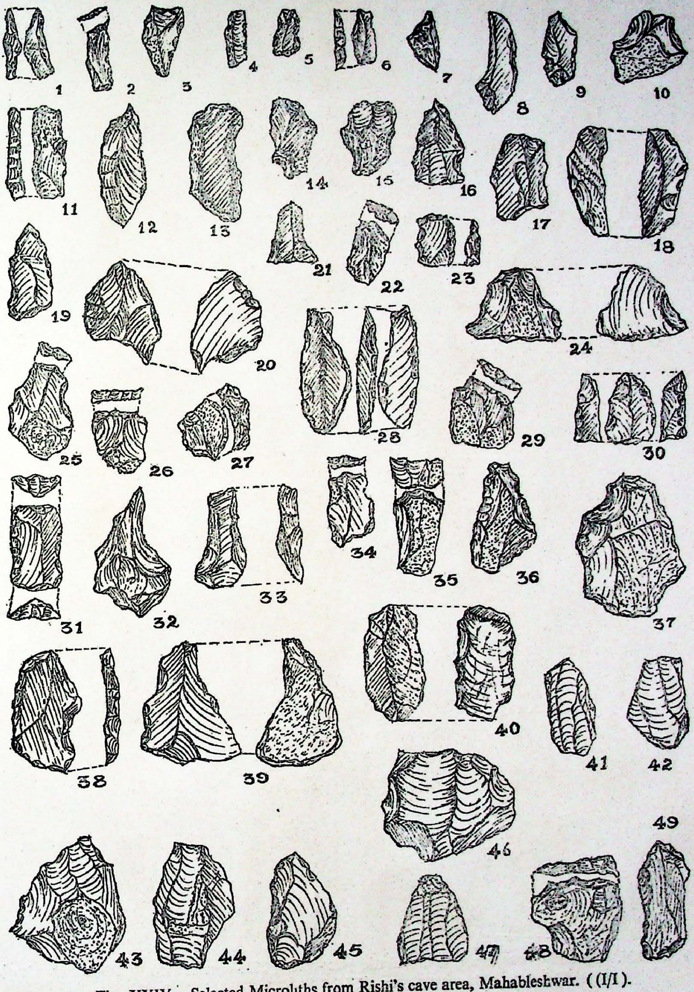

Fig. XXIV. Selected Microliths from Rishi's cave area, Mahableshwar. ((I/I).

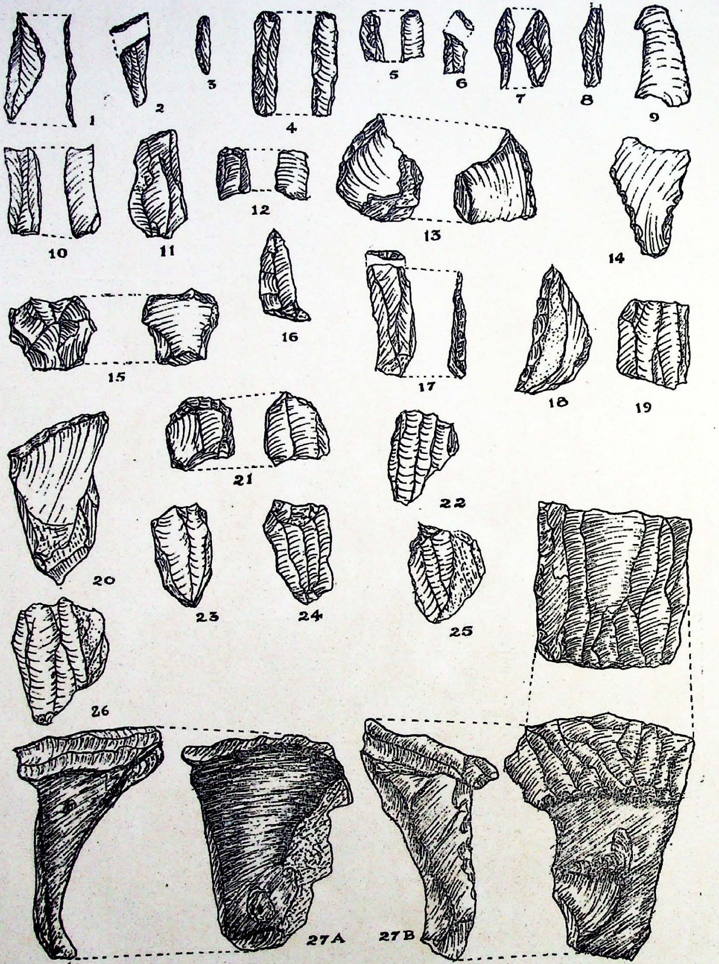

Fig. XXV. Selected Microliths and the Bottle glass-core (27A-Ventral view, 27B-Dorsal view) from Talechamet, Mahableshwar. (I/I).

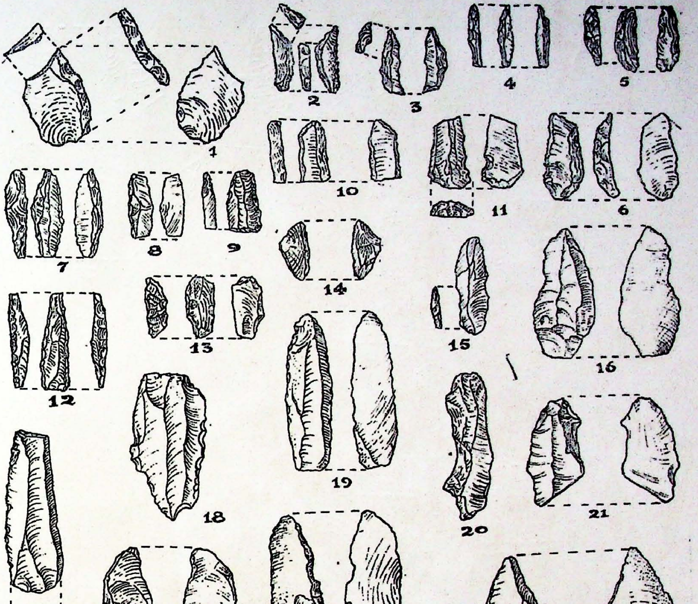

Fig. XXVI. Microliths from the factory site of Ambenali-Jaoli, Satara. (I/I).

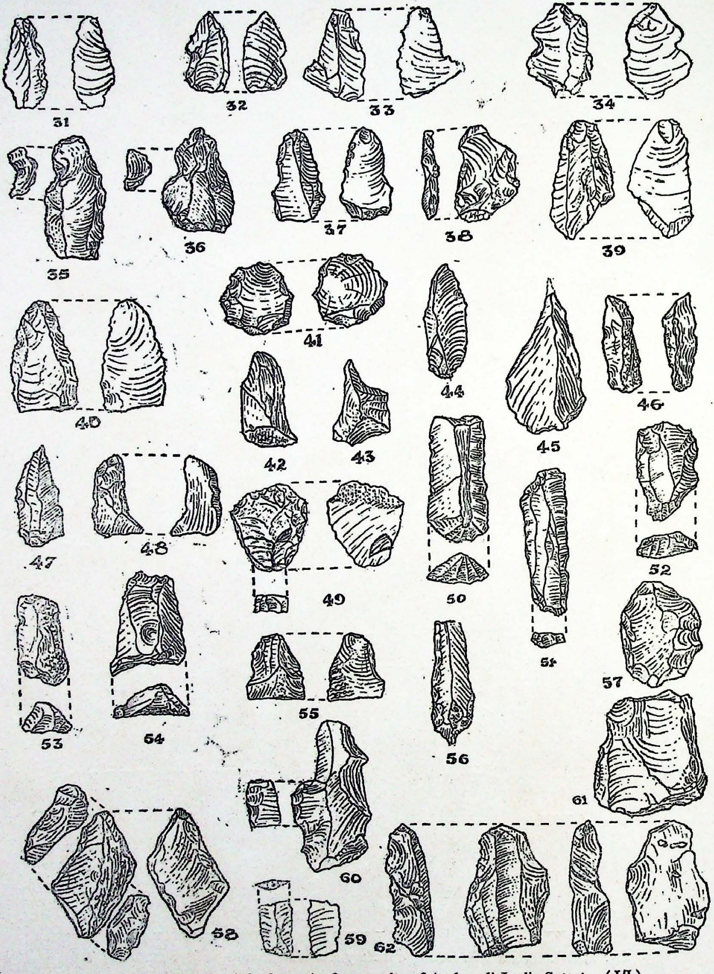

Fig. XXVII. Microliths from the factory site of Ambenali-Jaoli, Satarà. (I/I).

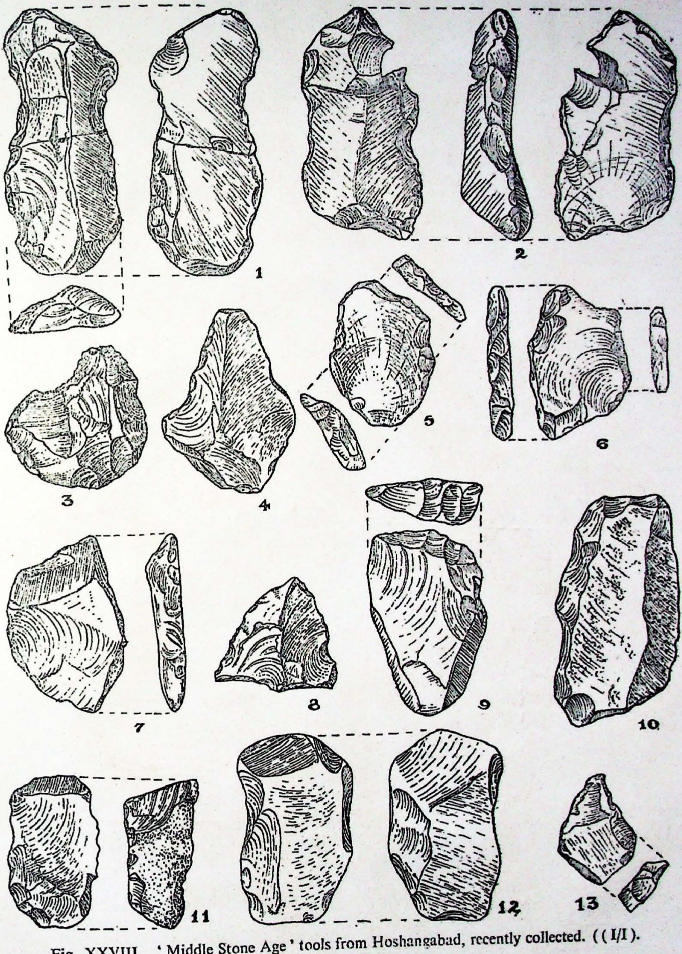

Fig. XXVIII. 'Middle Stone Age' tools from Hoshangabad, recently collected. ((I/I).

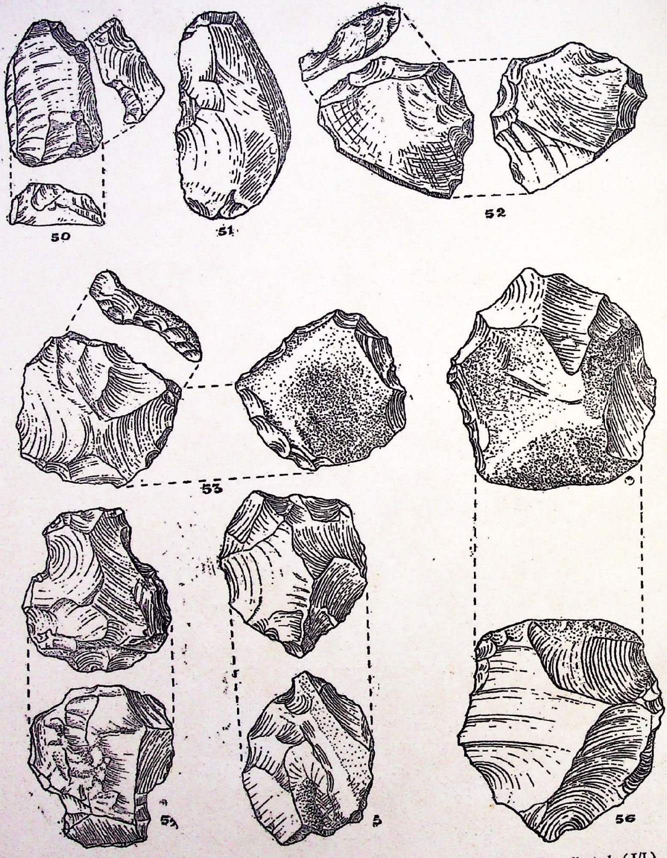

Fig. XXIX. 'Middle Stone Age' tools from Adamgarh, Hoshangabad recently collected. (I/I).

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